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ROCKY MOUNTAIN ARSENAL

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FINAL PHASE I
CONTAMINATION ASSESSMENT REPORT
SITE 30-1: IMPACT AREA
(INCLUDES 30-7: GROUND DISTURBANCE)
(Version 3.3)

January 1988
Contract Number DAAK11-84-D0016
Task Number 14 (Army Sites North)

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

HARDING LAWSON ASSOCIATES MIDWEST RESEARCH INSTITUTE

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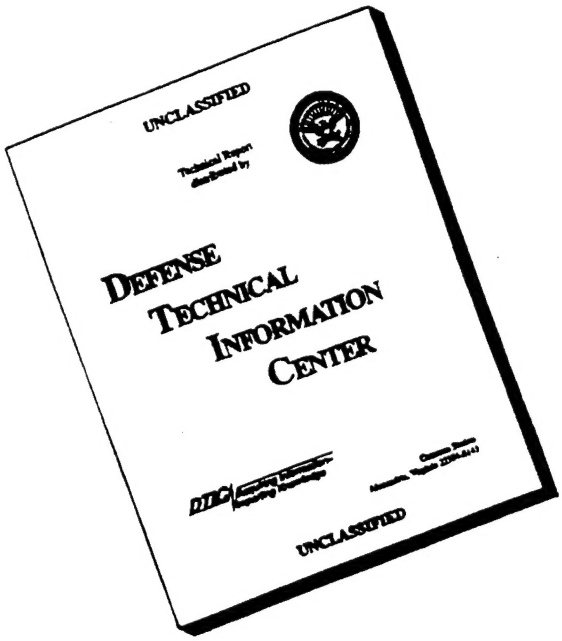

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REPORT DOCUMENTATION PAGE

Form Approved
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1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	01/00/88	

4. TITLE AND SUBTITLE
CONTAMINATION ASSESSMENT REPORT, PHASE I, SITE 30-1, IMPACT AREA (INCLUDES 30-7 GROUND DISTURBANCE) TASK 14, ARMY SITES NORTH, FINAL, VERSION 3.3

5. FUNDING NUMBERS
DAAK11 84 D 0016

6. AUTHOR(S)

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
ENVIRONMENTAL SCIENCE AND ENGINEERING
ENGLEWOOD, CO

8. PERFORMING ORGANIZATION REPORT NUMBER
88033R03

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
ROCKY MOUNTAIN ARSENAL (CO.). PMRMA
COMMERCE CITY, CO

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

THIS FINAL REPORT DOCUMENTS THE PHASE I CONTAMINATION SURVEY OF SITE 30-1, USED FROM 1945 TO 1951 AS AN IMPACT AREA FOR 4.2 INCH MORTARS.

66 SAMPLES FROM 29 BORINGS WERE ANALYZED FOR VOLATILE AND SEMIVOLATILE ORGANICS AND METALS WITH SEPARATE ANALYSES FOR AS AND HG. CU, PB, AND ZN WERE DETECTED ABOVE INDICATOR RANGES; HOWEVER, THESE ELEVATED METAL VALUES ARE ASSOCIATED WITH BEDROCK WHICH CONSISTS OF VOLCANICLASTIC MATERIAL. NO TARGET ORGANIC COMPOUNDS WERE DETECTED. METAL ANOMALIES WERE FOUND AT THE SITE.

A PHASE II PROGRAM CONSISTING OF 5 ADDITIONAL BORINGS IS RECOMMENDED TO INVESTIGATE THREE AREAS WHICH HAVE NOT BEEN FULLY INVESTIGATED. THE VOLUME OF POTENTIALLY CONTAMINATED MATERIAL PRESENT IS ESTIMATED AT 70,000 BANK CUBIC YARDS.

APPENDICES: CHEMICAL NAMES, PHASE I CHEMICAL DATA, COMMENTS AND RESPONSES.

14. SUBJECT TERMS
GEOLOGY, HYDROLOGY, GEOPHYSICAL EXPLORATION, ANALYTES, SOIL SAMPLING, CHEMICAL DATA, MUNITIONS

15. NUMBER OF PAGES

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED			

LITIGATION TECHNICAL SUPPORT AND SERVICES

Rocky Mountain Arsenal

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PREPARED BY

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Harding Lawson Associates Midwest Research Institute
(Prepared under Task 21)

PREPARED FOR

U.S. ARMY PROGRAM MANAGER'S OFFICE FOR ROCKY MOUNTAIN ARSENAL

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

SITE 30-1: IMPACT AREA

Site 30-1, Impact Area, is in the northeast portion of Rocky Mountain Arsenal (RMA) in Section 30. The site was used as a mortar impact area from 1946 until the early 1950's, although the source of mortar fire is uncertain. This site was investigated under Task 14 in the spring of 1986. A total of 29 soil borings were drilled to depths of 5 to 10 feet (ft) and 66 samples were collected. An extensive geophysical reconnaissance program using magnetic and electromagnetic techniques was performed over the entire site. An additional investigation consisted of surface sweeps for metal debris, test pit excavations for geophysical anomalies, and several borings drilled for geological information.

Four other sites (30-4, 30-5, 30-6, and 30-7) are within the Site 30-1 boundaries. Site 30-7, a ground disturbance of unknown origin, is included in this Site 30-1 investigation. Site 30-4 (Sanitary Landfill) is addressed in a Task 7 investigation. The remaining two sites are addressed in independent Task 14 Contamination Assessment Reports.

Copper, lead, and zinc were the only metals detected at concentrations above their indicator ranges. All other metal values were within or below their respective indicator ranges. Elevated metal values are associated with a well-defined bedrock high which consists, in part, of Tertiary-age volcaniclastic material. No target organic compounds were detected at this site. Several nontarget organic compounds were detected at low concentrations and were tentatively identified as natural organic products, phthalates, and unknown hydrocarbons.

A Phase II program consisting of 5 soil borings (20 samples) is recommended to investigate three areas (a geophysical anomaly, a trench, and a possible burn site) which were not fully investigated by the Phase I investigation. These three areas are estimated to cover 37,500 square feet (ft^2) and to contain 8,400 bank cubic yards (bcy) of potentially contaminated soil.

Phase I data and aerial photographs indicate that the main portion of the mortar impact range is in the area of visible impact craters and is estimated to cover 2,100,000 ft^2 (approximately 1,000 by 2,100 ft). Results also suggest that up to 70,000 bcy of soil in the impact range may be contaminated with a large quantity of small metal pieces and unexploded ordnance (UXO).

SITE 30-1: IMPACT AREA
(Includes 30-7: Ground Disturbance)

1.0 PHYSICAL SETTING

1.1 LOCATION

Site 30-1, the primary impact area for 4.2-inch mortar rounds, comprises most of the southeast corner of Section 30 as shown in Figure 30-1-1. A dirt road in the southeast corner of the section once encircled the site which was considered to be the primary impact range (Geraghty and Miller, 1982, RIC#81342R06; Stout et al., 1982, RIC#83368R01; RMACCPMT, 1984, RIC#84034R01). The following four sites are within and adjacent to Site 30-1:

Site	Description/Activity
30-4	Sanitary landfill
30-5	M-34(GB) Demilitarization area
30-6	M-34 disposal trenches
30-7	Ground disturbance, unknown origin

Sites 30-4, 30-5, and 30-6 are addressed in other Contamination Assessment Reports, while Site 30-7 is included as part of this Site 30-1 Contamination Assessment Report. Because the boundaries for Site 30-1 were not discernible on any aerial photograph, they were derived from the 1984 Rocky Mountain Arsenal Contamination Control Program Management Team map (RMACCPMT) (RIC#84034R01). Visible impact craters were also used to determine the site boundaries.

1.2 GEOLOGY

Site 30-1 is situated on Pleistocene alluvium which consists of interbedded silty sand, gravel, and clay partly covered by a thin layer of eolian silt and sand. The thickness of the alluvium generally varies from 2 to 20 feet (ft), with the thickest portion located along the western boundary near First Creek, in the vicinity of Well 30010 (May, 1982, RIC#82295R01). The eastern portion of the site is located over a bedrock high and has a thin alluvial cover.

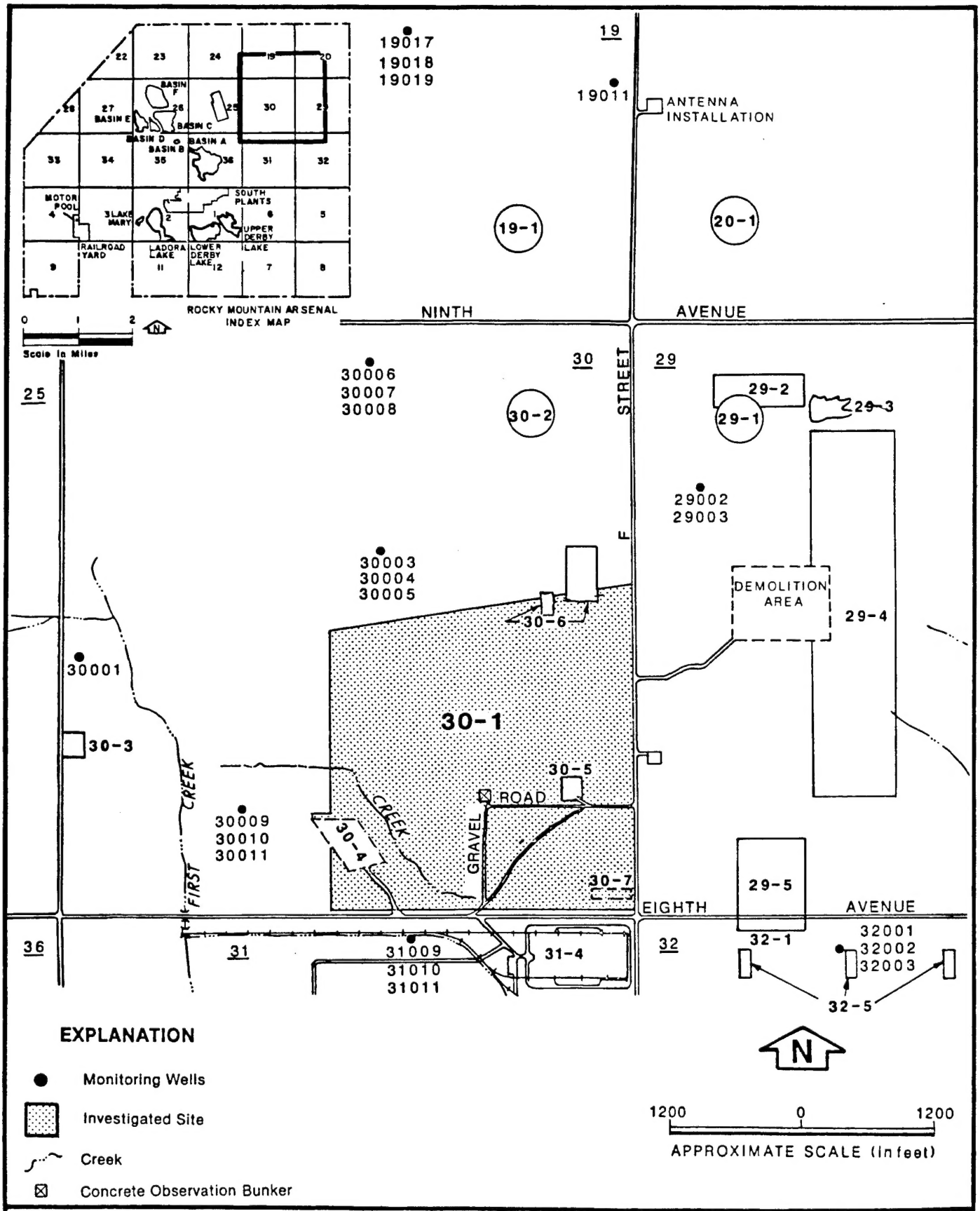

Figure 30-1-1
SITE LOCATION MAP
SITE 30-1
ROCKY MOUNTAIN ARSENAL
SOURCE: ESE, 1987

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For Rocky Mountain Arsenal
Aberdeen Proving Ground, Maryland

The alluvium is underlain by the Denver Formation which is characterized by bentonite-rich clay/shale and compact lenticular sand horizons. Lithologic variations in the Denver Formation include interbedded siltstone, claystone, sandstone, conglomerate, low-grade coal, lignite, and volcaniclastic material. The sandstone units are as much as 20-ft thick and are typically discontinuous, loosely to poorly cemented, and commonly grade into siltstone or shale. Locally, however, the sands are well-cemented (Stollar and van der Leeden, 1981, RIC#81293R05; Geraghty and Miller, 1982, RIC#81342R06; May, 1982, RIC#82295R01; RMACCPMT, 1983, RIC#83326R01; Clark, 1985, RIC#85183R01; Anderson et al., 1979, RIC#85214R03).

The Phase I boring program investigated the alluvium and bedrock at 29 boring locations. A sandy silt or silty sand interbedded with clayey silt lenses was the dominant soil type encountered. Grain size and sand content generally increased with depth. The Denver Formation was encountered in four borings as follows:

Boring No.	Depth (ft)	Lithologies
5334	9	weathered volcaniclastic
5335	6	weathered claystone
5341	5	weathered volcaniclastic
5345	7	weathered volcaniclastic

Borings in Site 30-5, which is within Site 30-1 (Figure 30-1-1), encountered Denver Formation claystone at depths of 3 to 4 ft. Boring logs 5334 and 5335 (Figures 30-1-2 and 30-1-3) are representative of surficial site geology at Site 30-1.

1.3 HYDROLOGY

Site 30-1 is situated in the First Creek drainage basin on a west to southwest-facing slope (Figure 30-1-4). Elevations along the eastern site border (F Street) range from approximately 5,247 to 5,270 ft above mean sea level (ft msl); elevations in the southwest part of the site range from approximately 5,220 to 5,230 ft msl. Surface drainage generally flows west toward First Creek, which is approximately 1,300 ft west of the western site boundary (Figure 30-1-4). Site 30-4 (Sanitary Landfill) lies between Site 30-1 and First Creek and may receive surface runoff from Site 30-1.

A small unnamed drainage channel crosses Site 30-1 from the south boundary and flows northwest toward First Creek (Figure 30-1-4). In a 1964 aerial

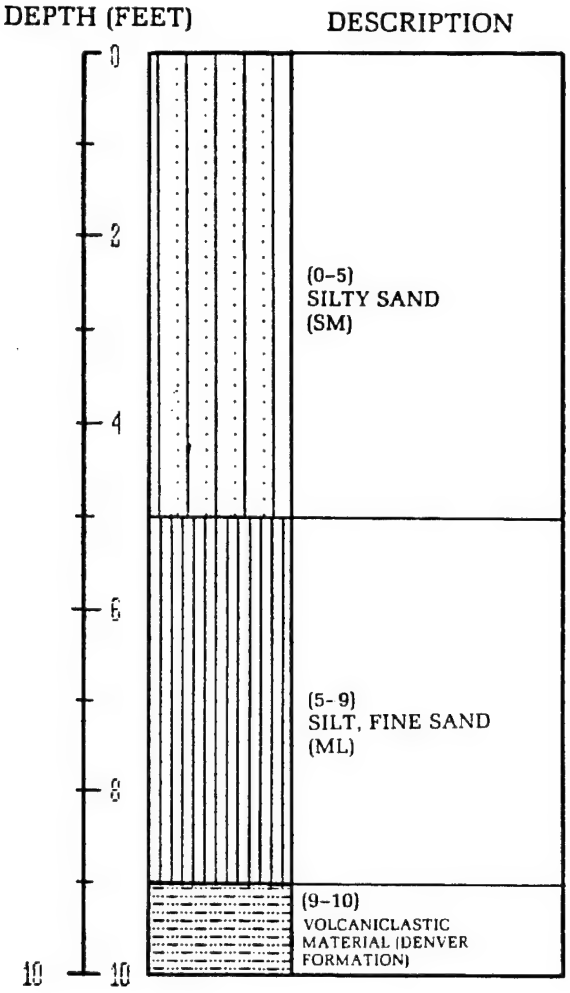

Figure 30-1-2
FIELD BORING PROFILE
FOR BORING 5334
SOURCE: ESE, 1987

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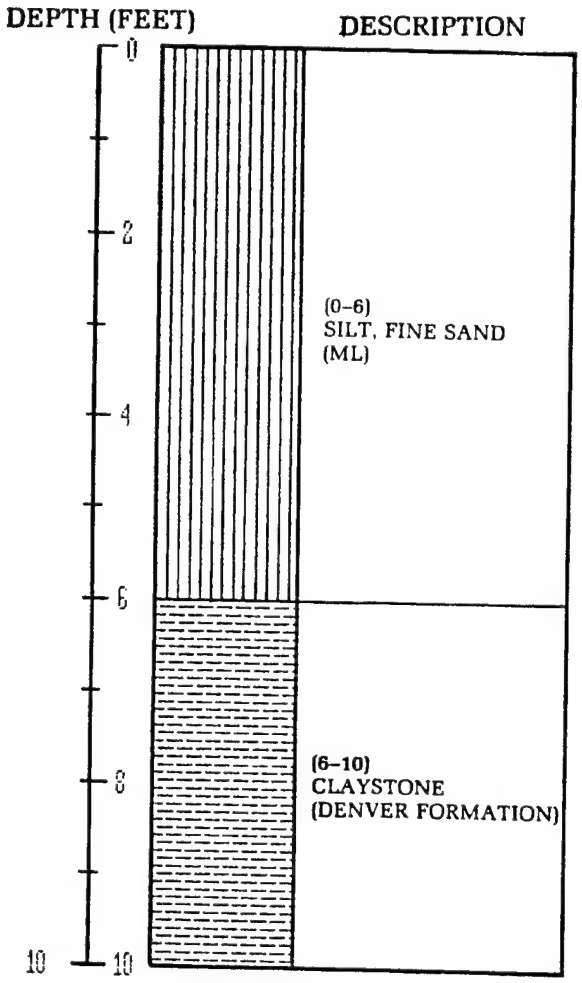

Figure 30-1-3
FIELD BORING PROFILE
FOR BORING 5335
SOURCE: ESE, 1987

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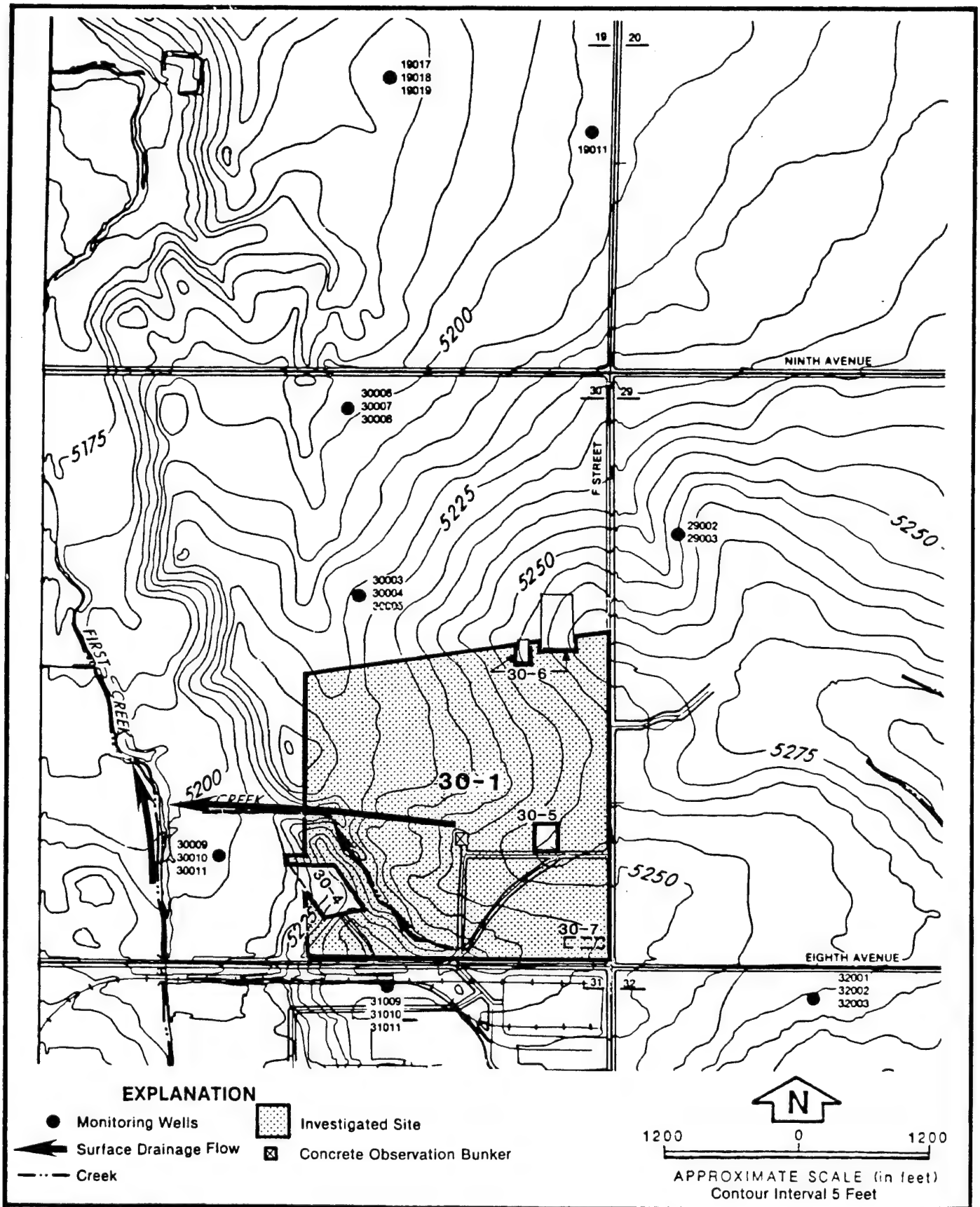

Figure 30-1-4
REGIONAL TOPOGRAPHY,
SITE 30-1
ROCKY MOUNTAIN ARSENAL
SOURCE: ESE, 1987

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photograph, liquid was noted in this channel, although it was not entering First Creek (Stout et al., 1982, RIC#83368R01). It is unknown what effect, if any, this small drainage has had on the hydrology of the area.

Most of Section 30 overlies a bedrock high. The water table lies below the alluvial-Denver Formation contact at an elevation of approximately 5,195 to 5,220 ft msl. Available data indicate that the water table occurs within the alluvium only in the southwestern portion of the site (RMACCPMT, 1983, RIC#83326R01).

Water levels measured during the Task 4 Initial Screening Program indicate that wells surrounding Site 30-1 (Figure 30-1-5) have depths to water ranging from 8.5 ft (5,197 ft msl, Well 30009) in the west to 35 ft (5,214 ft msl, Well 29002) in the northeast (ESE, 1986c, RIC#86238R08). Wells to the north (Well 30004) and south (Well 31009) have depth to water measurements of 29.6 (5,195 ft msl) and 27.4 ft (5,214 ft msl), respectively. Ground water flow is generally to the northwest.

Historical data (Clark, 1985, RIC#85183R01) suggest that the water table elevation in this area has varied little over the past 5 years. Phase I borings were drilled to a depth of 10 ft, but did not penetrate the water table. An isolated 10 parts per billion (ppb) endrin value was reported downgradient in Denver Formation Well 30005 (ESE, 1986c, RIC#86238R08). These results, however, are provided for background purposes and are not intended to be correlated with soil sample analytical results generated as part of the Phase I study. It is not possible to determine on the basis of available data if activities at Site 30-1 have affected ground water beneath this site.

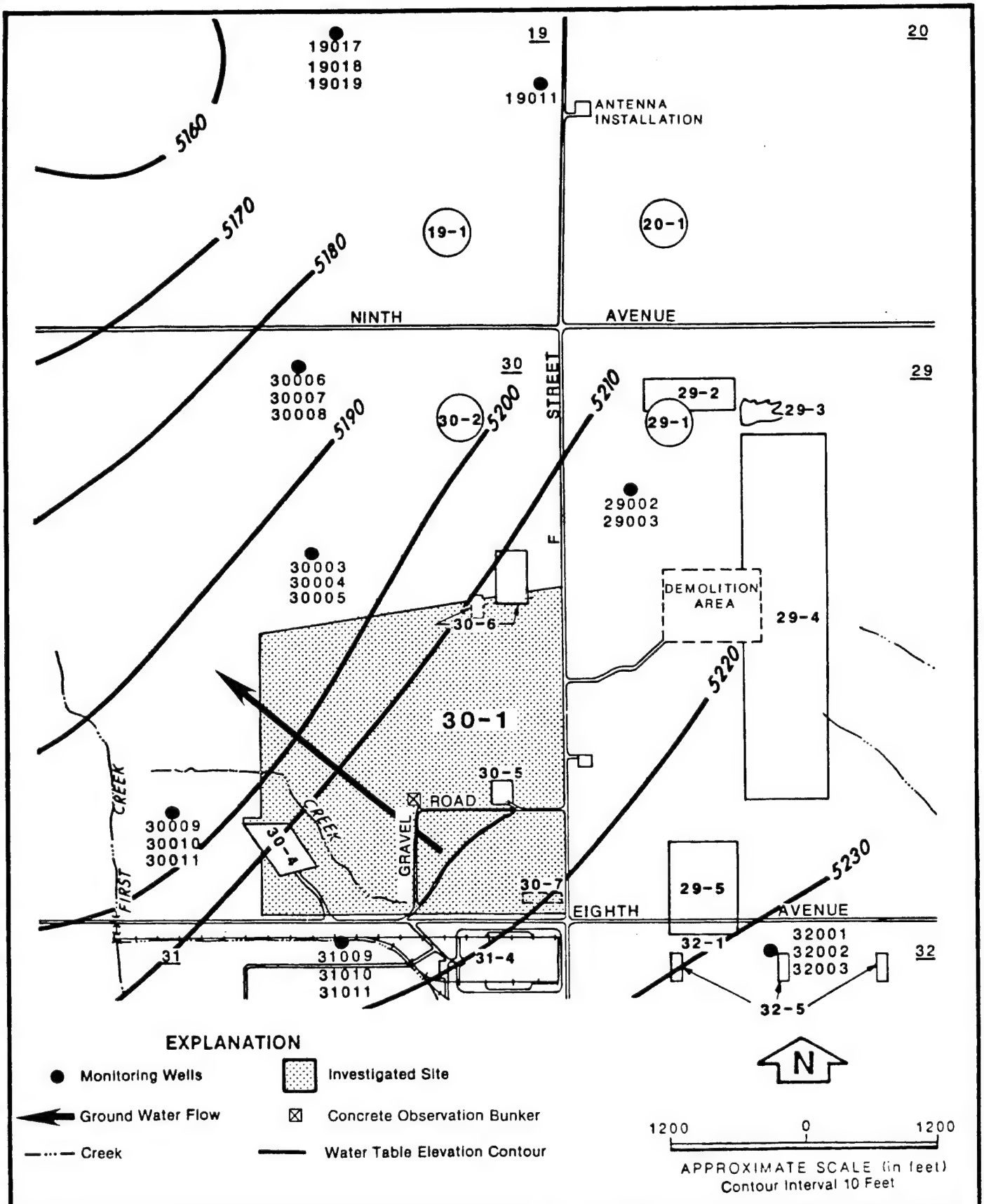

Figure 30-1-5
REGIONAL GROUND WATER FLOW
SITE 30-1
ROCKY MOUNTAIN ARSENAL
SOURCE: ESE, 1987

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Aberdeen Proving Ground, Maryland

2.0 HISTORY

Section 30 was part of the original buffer zone for RMA operations from 1945 until 1951, when the RMA boundary was moved east to its present location. From 1945 to 1951, Site 30-1 was reportedly used as an impact range for 4.2-inch mortars (Wingfield, 1977, RIC#81266R68). Several resources describe the impact range differently. One drawing illustrates that areas of Sections 26, 35, 25, 36, 30, 31, 29 and 32 were part of the mortar range (RMA, 1946). Four observation posts were associated with the reported mortar range, one which was located atop Rattlesnake Hill in Section 35, one atop the hill on Eighth Avenue between D and E streets in Section 25, one at the intersection of E Street and Eighth Avenue, and a concrete bunker in Section 30 (U.S. Army Chemical Corps, 1945; U.S. Army Chemical Corps, 1946). The 1949 aerial photograph of Section 30 shows a dirt road in the southeast section corner that encircles an area considered to be the primary impact range (Geraghty and Miller, 1982, RIC#81342R06).

The Installation Assessment Report (Wingfield, 1977, RIC#81266R68) suggests that the impact area includes the northeast corner of Section 30 and the adjacent areas of Sections 19, 20, and 29. This location appears unlikely, however, since Sections 19 and 20 were outside the RMA boundary in the late 1940's (Geraghty and Miller, 1982, RIC#81342R06). Although 4.2-inch mortar fragments have been found in the south-central portion of Section 30, no fragments have been found in the northeast portion of the section (Wingfield, 1977, RIC#81266R68).

A concrete bunker, used to observe mortar impacts, is located near the center of the site. Windows in the bunker are present only on the north and west sides, suggesting that the main impact range was north of the bunker. The ground disturbance identified as Site 30-7 in the southeast corner of Site 30-1, was located on a 1958 aerial photograph, but its history is unknown (RMACCPMT, 1984, RIC#84034R01). It is unlikely that Site 30-7 was in the Section 30 impact range due to its proximity to the southeast section corner. The 1958 aerial photograph does show a trench at Site 30-7 (Stout et al., 1982, RIC#83368R01), although no information is available on what,

if anything, may have been disposed of in the trench. Drawing D-748 and pre-Arsenal aerial photographs indicate a farming silo once stood directly adjacent to F Street, just northeast of Site 30-5.

U.S. Army Technical Escort Center (TEC) personnel have indicated that the maximum penetration depth for 4.2-inch mortars is 8 ft. Six ft is considered a conservative average for subsurface dud rounds (RMACCPMT, 1984, RIC#84034R01). Explosive chemicals contained within mortar shells should detonate upon impact leaving little or no contamination. Soil contamination from UXO is expected to be minimal at this site (Geraghty and Miller, 1982, RIC#81342R06).

Site 30-1 is suspected of being contaminated with organic, inorganic, and heavy metal contaminants, in addition to UXO (RMACCPMT, 1984, RIC#84034R01). The soil is believed to contain scrap metal fragments from 4.2-inch mortar impacts and 4.2-inch unexploded rounds which may contain high explosive (HE), white phosphorus (WP), smoke (FS) filler, or slugs (Wingfield, 1977, RIC#81266R68; Geraghty and Miller, 1982, RIC#81342R06).

The available aerial photographs (Stout et al., 1982, RIC#83368R01) may be summarized as follows:

Photograph Date	Description
October 21, 1948	Only the westernmost portion of the site is shown in this photograph. The photograph clearly shows a dirt road extending north from Eighth Avenue for approximately one-half mile, then turning east-northeast and eventually intersecting F Street. This road defines the western and northern margins of Site 30-1.
October 15, 1964	The road described above is still clearly visible in this photograph and the observation bunker is present. The access road to the demilitarization operation (Site 30-5) is now clearly visible, as are the trenches comprising Sites 30-6 and 30-7. A north-northeast dirt track leading from the observation bunker near the center of Site 30-1 to the vicinity of Site 30-6 is also visible in this photograph. A light-colored, small rectangular

	area thought to be remains of a farming silo is clearly shown northeast of Site 30-5 and directly adjacent to F Street. Four light gray scars approximately 90 ft in diameter are visible in this photograph. Two scars are west and two are approximately 1,200 ft northwest of Site 30-6. The scars are not thought to be related to Site 30-1 activities. All of the scars are north of the designated site.
April 28, 1974	The dirt roads and tracks described in the 1964 photograph are still visible, although some are faint. The rectangular area of unknown origin northeast of Site 30-5 now appears to be a blackened, possible burn area. The sanitary landfill (Site 30-4) is clearly defined near the southwest corner of Site 30-1. The northwest portion of the site has a light-colored ground scar which may be related to impact craters located directly north.
September 20, 1980	The sanitary landfill (Site 30-4) has been expanded to the northwest and has obscured the north-south road which once defined the western margin of Site 30-1. Brackets are drawn on the photograph which distinguish the boundaries of the old and new landfills. The blackened area east-northeast of the demilitarization operation is still well-defined. Impact craters are now visible in the northwest quadrant of the site. Many impact craters are visible to the north and northwest of Site 30-5 as well. Two trenches oriented northwest-southeast are visible in the southwest portion of the site, east of the landfill access road.
December 31, 1985	A long, thin, apparently shallow excavation is west-northwest of the demilitarization operation in this photograph. Another similar excavation is 400 ft north of the observation bunker. Several east-west linear berms are in the southeast quadrant of the site. The southwest portion of the site east of the landfill access road appears irregular and hilly.

The fact that many visible impact craters occur in the north-central part of the site does not fully correspond with the 1977 Records Evaluation Report (Wingfield, 1977, RIC#81266R68), which shows the impact range extending northeast across Section 30 and into Sections 19, 20, and 29. Mr. William

Moloney (Quality Assurance, RMA) has suggested that the impact range is north of the observation bunker (Figure 30-1-1) and doubts that the GB demilitarization facility (Site 30-5) would have been constructed on any part of the impact range. Windows in the observation bunker only face north and west; thus, it is unlikely that mortars were intentionally fired to the southern and eastern parts of Section 30, beyond the effective view of the observation bunker.

3.0 SITE INVESTIGATION

3.1. PREVIOUS SOIL INVESTIGATIONS

The soil at Site 30-1 has been mapped by the U.S. Soil Conservation Service (Sampson and Baber, 1974) as Ascalon sandy loam, Ascalon-Vona sandy loam, and Platner loam. Ascalon soil is sandy loam containing varying amounts of sand and gravel which become clay-rich and calcareous with depth. Ascalon-Vona soil is somewhat sandier than Ascalon soil and is better drained. Soil of the Platner loam series is typically gray-brown, noncalcareous, silty loam which becomes more clay-rich and calcareous with depth. No previous soil contamination studies are documented for this site.

3.2 PHASE I SURVEY

3.2.1 Phase I Program

The Phase I program consisted of an extensive geophysical survey and a soil boring program which was intended to locate large-scale burial sites or anomalous soil conditions. Twenty-nine soil borings yielding 66 soil bedrock samples were drilled at an average spacing of 450 ft over this 7,219,000 ft^2 site. Twenty-one borings were drilled to a depth of 5 ft, and eight borings were drilled to 10 ft. Four borings (5334, 5335, 5341, and 5345) encountered claystone bedrock. The 29 Phase I borings were drilled as follows:

Boring Number	Depth (ft)	Number of Samples
5325	5	2
5326	10	3
5327	5	2
5328	5	2
5329	5	2
5330	5	2
5331	5	2
5332	5	2
5333	10	3
5334	10	3
5335	10	3
5336	5	2
5337	5	2
5338	5	2
5339	5	2
5340	5	2
5341	10	3

5342	5		2
5343	5		2
5344	5		2
5345	10		3
5346	5		2
5347	5		2
5348	10		3
5349	5		2
5350	10		3
5351	5		2
5352	5		2
5353	5		2
		TOTAL	66

During the geophysical investigation of this site, an anomalous response area was identified south of Site 30-4. This was determined to be the old Sanitary Landfill, and was referred to Task 7 for investigation. Six soil borings were placed in this area under Task 7.

The geophysical program at this site also indicated widespread magnetic and electromagnetic response on the eastern and northern portions of the site. Seven borings were drilled and a pit was dug to provide more information on the anomalous responses. Two surface sweeps for metal debris characterization were also conducted; one within the primary impact area and another in an area of abundant metal debris near Eighth Avenue.

Soil samples were collected using the continuous soil sampling method detailed in the Task 14 Technical Plan (ESE, 1986b, RIC #86238R04). Samples were obtained at predetermined intervals unless field conditions [i.e., water table, staining, etc.] required an adjustment in the intervals. No adjustment was required in intervals from Site 30-1 borings.

Boring locations, pertinent surficial objects, and historical features from aerial photographs have been combined and presented on the boring location map (Figure 30-1-6). Borehole sites were selected on the basis of visual evidence, historical reports, aerial photographs, and geophysical results. Boring 5325 was located within the boundaries of Site 30-7; all other borings were situated in Site 30-1.

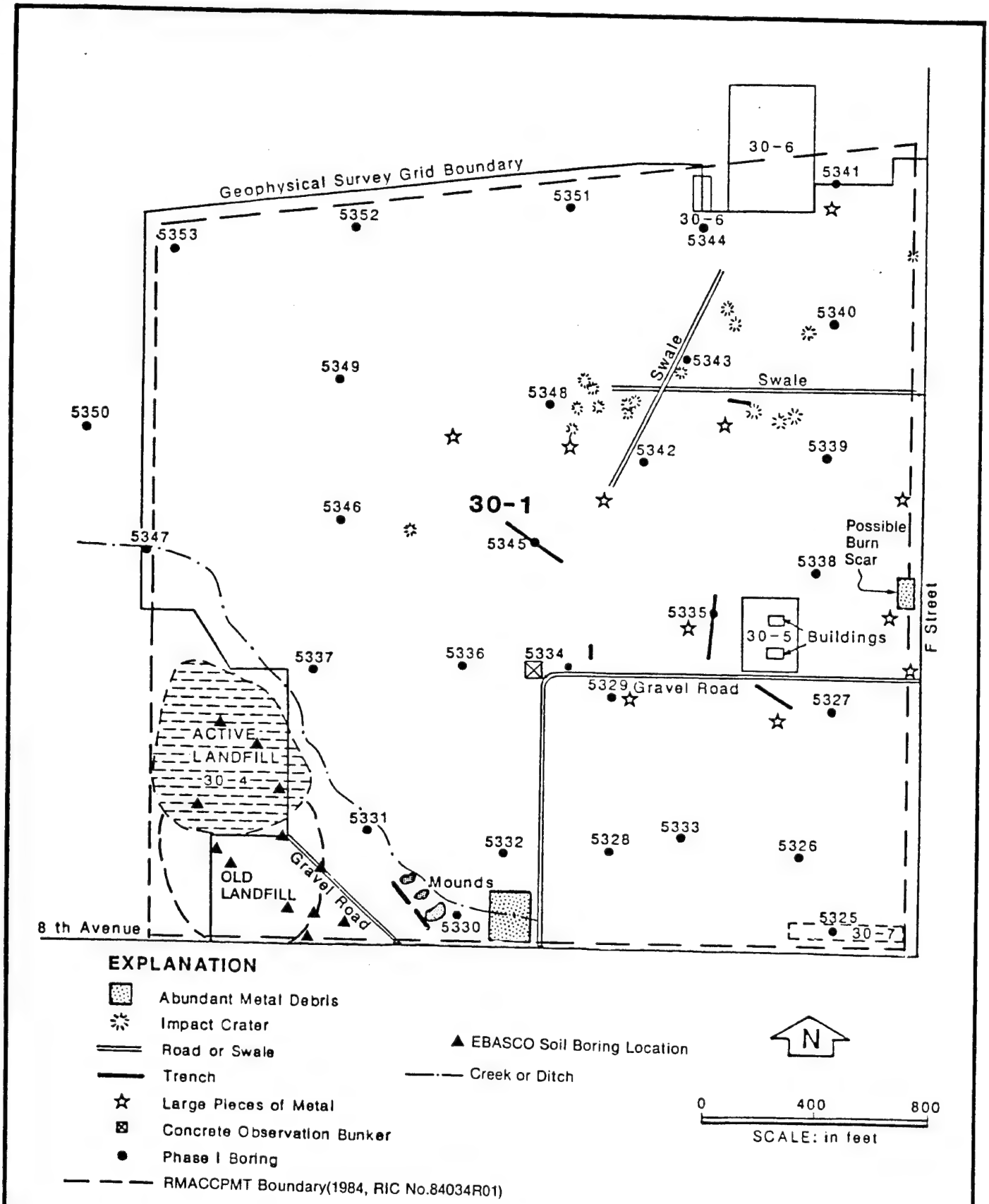

Figure 30-1-6
PHASE I INVESTIGATION
BORING LOCATION MAP
SITE 30-1

SOURCE: HARDING LAWSON ASSOCIATES, 1987

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For Rocky Mountain Arsenal
Aberdeen Proving Ground, Maryland

Prior to drilling, all borehole sites were cleared for safety purposes in accordance with the geophysical program detailed in the Task 14 Technical Plan (ESE, 1986b, RIC#86238R04). Borehole site clearance was used to ensure drilling would not encounter buried UXO or other metal that could pose a significant safety risk. Magnetic intensity readings were obtained with a gradiometer. A 20-ft-square grid was centered at each boring location, and gradiometer readings were obtained at a spacing of 5 ft throughout the area. A contour map was prepared from the data and used to place the boring in the safest location within the geophysical plot. Following borehole clearance with the gradiometer, a metal detector was used to check for surficial (0 to 2 ft) metal which may have presented a safety risk. Twenty-two borings were relocated slightly due to borehole site clearance. This procedure should not be confused with the geophysical exploration program outlined in Section 3.2.3 of this report.

A photoionization detector (PID), calibrated to an isobutylene standard, was used to obtain readings from the open boreholes during drilling and from soil samples during geologic logging. The PID measures the concentration of organic vapors in the air and is a method of ensuring personnel safety.

All samples were analyzed by gas chromatography/mass spectrometry (GC/MS) for semivolatile organic compounds and by inductively-coupled argon plasma (ICP) analyses for cadmium, chromium, copper, lead, and zinc. All samples were analyzed for arsenic and mercury by atomic absorption (AA) spectroscopy. A GC/MS volatile organic analysis was performed on five samples from the 9- to 10-ft interval as follows: 5326, 5334, 5335, 5345, and 5348. A complete list of the Phase I analytes is in Appendix 30-1-A.

The Phase I remedial investigation program for this site was developed and implemented based on historical documentation, aerial photographs, and other information available at the time of its implementation. Since that time, previously unavailable information has been identified and incorporated into the history section of this report. Furthermore, this additional information has been evaluated in detail to determine how it might impact the investigation approach at this site. Based upon this evaluation, it has been determined that the additional information collected since the Phase I

and Phase II program was designed does not substantially alter the view of potential contamination at this site. As a result, the Phase I program as conducted and Phase II program as planned is judged to provide a complete and accurate investigation of the possible contamination at this site.

3.2.2 Phase_I_Field_Observations

Several linear surface scars were noted at Site 30-1. Boring 5345 was drilled in a 175- by 30-ft-wide trench oriented northwest-southeast, Boring 5335 was also drilled in a trench, and Boring 5334 was drilled in a ditch beside a gravel road running east-west. No indications of disposal activity were present in any borehole sample from these trenches, nor were any surface indications of disposal noted. Boring 5347 was placed within a small drainage channel in the western portion of the site.

Several depressions (impact craters) were noted within the site (Figure 30-1-6). Most depressions were small and shallow (6 ft wide by 3 ft deep). A general field search in the northern part of the site near Borings 5345, 5348, 5342, and 5343 revealed an abundant number of small pieces of shrapnel associated with these impact craters. Most metal pieces were only 1 to 2 inches square in size, but occasionally they were 1 ft^2. Only a few pieces of shrapnel were found over a 3,000 ft^2 area along the northern site boundary approximately 1,000 ft west of Site 30-6. A second field search of a 2,300 ft^2 area was conducted within a broad zone of intense geophysical anomalies 300 ft southwest of Site 30-5. Only 20 small pieces of metal were found, most of which were 2- to 4-inch-long, pencil-shaped fragments. The quantity of metal in the general area southwest of Site 30-5 is estimated to be 5 to 10 times less than that found in the north-central portion of Site 30-1.

A 1-acre area within the primary impact area was staked and a surface sweep was conducted. Personnel with expertise in UXO identification recovered 14 fuzes, 20 blasting caps, two 40mm grenades, and 1 dud smoke grenade from the area. The items were stored in a magazine for future detonation. A second

surface sweep was conducted in an area of abundant metal debris near Eighth Avenue. Material identified in this area was innocuous scrap metal that did not warrant further investigation.

A 100- by 200-ft area along F Street was described as a possible burn scar by Stout et al. (1982, RIC#83368R01). A field search of this area revealed abundant pieces of red brick, building tile, and concrete. The June 4, 1978 Drawing D-748, "4.2 inch Mortar Range", and pre-Arsenal aerial photographs indicate this to be the location of an agricultural-use silo. The area contained scattered small cans and abundant metal, although there was no surface evidence to suggest burning occurred in this area. The red brick and tile are thought to be the silo remains. The area, as mapped by the geophysical field crew, contained abundant scattered metal (Figure 30-1-6).

Boring 5345 contained visible staining in the 9- to 10-ft interval. Green specks and spots were noted in this sample, but no unusual field readings were detected.

An M8 alarm and M18A2 test kit were used to detect the presence of chemical agents in boreholes and soil samples. The M8 alarm is used to detect GB (Sarin) and VX at detection levels of 0.2 and 0.4 milligrams per cubic meter (mg/m^3) respectively, after a response time of 2 to 3 minutes [U.S. Army Materiel Development and Readiness Command (USAMDARC), 1982; USAMDARC, 1979; Headquarters-Department of the Army (HDOA), 1976]. However, many other substances, including smoke and engine exhaust, can activate the M8 alarm. The M18A2 is used as a backup test if an M8 alarm is triggered, as a substitute for an M8, and as a specific check for the presence of mustard. The M18A2 detects G agents, V agents, all forms of mustard, and Lewisite (L), based upon the knowledge that these agents were manufactured, stored, or demilitarized at the site (HDOA, 1976). The detection limit for mustard agents is 0.5 milligrams per cubic meter (mg/m^3) and the detection for GB is 0.2 mg/m^3. The detection limit for L in soil is 5 parts per million (ppm).

Historical evidence did not support further testing for chemical agents at this site. No positive tests or alarm activation occurred at this site. PID readings for this site were less than 2.3 and posed no risk to drilling personnel.

3.2.3 Geophysical Exploration

The two geophysical methods used in this Task 14 investigation included continuous magnetic surveying with a Geonics G-866, which measures minute changes in the earth's magnetic field, and continuous electromagnetic (EM) surveying with a Geonics EM-31D, which measures both in-phase and out-of-phase EM response.

Geophysics is an indirect technique that measures the electrical/physical properties of an object or lithology. Geophysical anomalies may be related to buried metal or to lithologic variations and/or depth to bedrock. The correct interpretation of geophysical data is dependent upon experience and extensive site knowledge to identify anomalies induced by debris or contaminant plumes.

Within the limitations inherent in the methods, the geophysical data obtained in this investigation can be used to infer the presence of metals or chemical contamination. Whereas the magnetic technique is sensitive to the presence of ferrous metal, in-phase EM techniques can be used to detect both ferrous and nonferrous metal. Out-of-phase EM techniques provide information regarding bulk soil conductivity and the possible presence of chemical contamination.

The geophysical survey consisted of alternating magnetic and EM lines spaced 25 ft apart. Continuous geophysical readings were taken along each traverse and stored on computer tape. Three individual contour maps were generated from the magnetic, EM in-phase, and EM out-of-phase data. Areas of anomalous geophysical response were noted for each map and used to produce a geophysical results summary map.

Results from the magnetometer and EM survey are summarized in Figure 30-1-7. The three major areas of magnetic anomalies and their locations are: Anomaly A, southwest corner; Anomaly B, southeastern to eastern portion of the site; and Anomaly C, northeast corner. Anomaly A coincides with a very strong in-phase EM response and defines the old landfill. Anomaly B is defined by numerous magnetic anomalies; the eastern one-half to one-third portion of this anomaly also contains abundant in-phase EM anomalies. Seven borings drilled in this area were logged for geologic characteristics and revealed volcaniclastic material (indicative of bedrock) at depths from 3 to 10 ft. The magnetic and electromagnetic response are attributed to the Denver Formation bedrock. Anomaly C extends beyond the northern geophysical survey grid boundary and consists of strong magnetic, in-phase EM, and out-of-phase EM anomalies. Anomaly C was investigated by an excavation pit in which shallow volcaniclastic material was also identified.

The geophysical survey was designed to detect large accumulations of metal buried in trenches or pits. Widely scattered pieces of shrapnel associated with mortar impacts are not detectable. Because the scattered magnetic anomalies shown on Figure 30-1-7 are not supported by accompanying in-phase EM anomalies, these small isolated magnetic anomalies probably represent shallow metal debris or localized bedrock anomalies.

A large curving band of out-of-phase EM anomalies extends from the northern to the eastern geophysical survey grid boundary. These anomalies are thought to be related to soil texture and/or moisture content. A second area of out-of-phase EM anomalies occurs in the southwest corner of the site just northeast of the old landfill area. The strongest portion of this anomaly (D) appears to be related to two small trenches and mounds west of Borehole 5330. In-phase EM values are also anomalous in this area, but are related to both the old landfill location and the two trenches and mounds.

An out-of-phase EM anomaly coincides with the north-south oriented trench west of Site 30-5. Although this trench is within the curving out-of-phase EM anomaly described above, greater intensities were measured by all three geophysical techniques in the immediate vicinity of the trench.

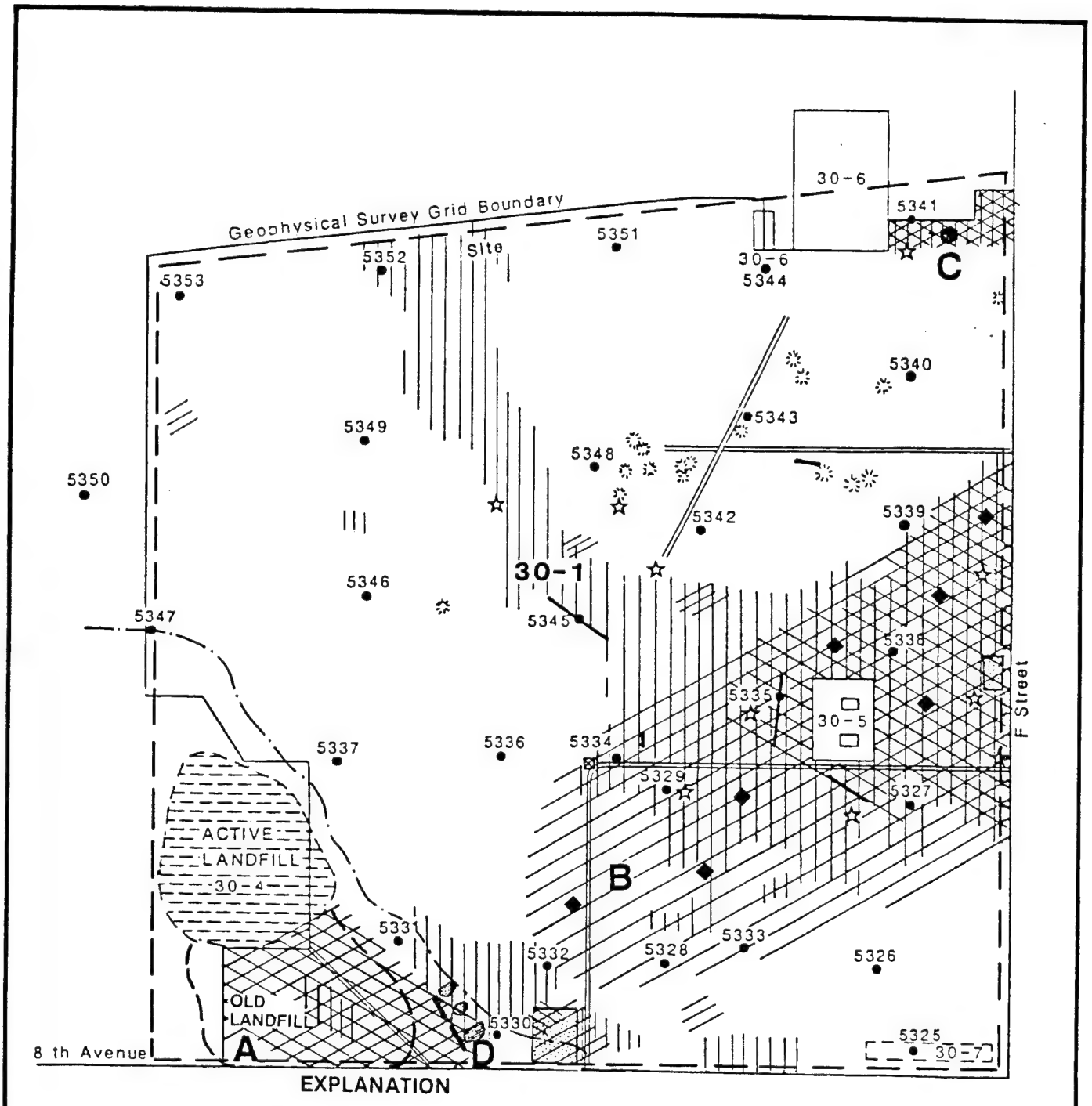

Figure 30-1-7
PHASE I INVESTIGATION,
GEOPHYSICAL RESULTS SUMMARY
SITE 30-1,
SOURCE: HARDING LAWSON ASSOCIATES, 1987

Prepared for:
U.S. Army Program Manager's Office
For Rocky Mountain Arsenal
Aberdeen Proving Ground, Maryland

3.2.4 Phase I Analyte Levels and Distribution

A statistical summary of Phase I analytical results is presented in Table 30-1-1. An analytical summary for each sample, including lithology and air monitoring results, is presented in Table 30-1-2. A listing of the target compounds and a tabulation of analytical data can be found in Appendices 30-1-A and 30-1-B.

To assess the significance of metal and organic analytical values, indicator ranges were established. For organic compounds, the indicator level is the method detection limit. For metals, a range of values was chosen to reflect the upper end of the normal range for each metal as naturally found in RMA alluvial soils. Selection of the ranges is discussed in the Introduction to the Contamination Assessment Reports (ESE, 1986a). Concentrations within and above indicator range for Phase I data are presented in Figure 30-1-8.

Most metal concentrations at this site are within their respective indicator ranges, except for samples near or from bedrock. Copper, zinc, and lead were the only metals found at concentrations exceeding their indicator ranges. Mercury was detected in two samples at 0.066 and 0.082 ppm, and arsenic was detected in 14 samples from 5.5 to 7.4 ppm. Cadmium was below the detection limit in all samples.

Six borings (5334, 5335, 5338, 5341, 5345, and 5352) contained metal concentrations above the indicator ranges. All six borings were situated in areas of high inferred soil conductivity and relatively shallow bedrock (Figure 30-1-7). Four of these borings (5334, 5335, 5341, and 5345) encountered weathered bedrock (volcaniclastics) at depths of 5- to 9-ft. Boring 5338 penetrated a stiff-textured silty clay horizon that may actually be weathered bedrock. The remaining boring (5352) contained brownish-clay silt, which may indicate a relatively higher organic content. The elevated organic content could be responsible for concentrating certain metals (Krauskopf, 1979). Target organic compounds were not detected in any of the 66 Phase I samples (Table 30-1-1).

Table 30-1-1. Summary of Analytical Results for Site 30-1

Constituent	Number of Samples*	Concentrations (µg/g) Range	Mean	Median	Standard Deviation	ESE Detection Limit	MRI Detection Limit	Indicator Range
Volatiles (N=5)†								
None Detected								DL
Semivolatiles (N=66)†								
None Detected								DL
ICP Metals (N=66)†								
Cadmium	0	--	--	--	--	0.90	0.50	DL-2.0
Chromium	57	8.1-25	15	16	3.8	7.2	7.4	25-40
Copper	66	5.8-58	17	14	9.7	4.8	4.9	20-35
Lead	36	20-41	28	28	5.2	17	16	25-40
Zinc	65	26-110	56	54	17	16	28	60-80
Arsenic (N=66)†	14	5.5-7.4	6.3	6.3	.54	4.7	5.2	DL-10
Mercury (N=66)†	2	0.066-0.082	--	--	--	0.050	0.070	DL-0.10

* Number of samples in which constituent was detected above the detection limits.
† N = Number of samples analyzed.
-- Not calculated for less than five detections.
DL Detection limit.

Source: ESE, 1987.

Table 30-1-2. Concentration of Target Analytes Above Detection Limits in Site 30-1 Soil Samples (Page 1 of 6)

Bore Number	5325	5325	5326	5326	5326	5327	5327	5328	5328	5329	5329	5330	5330
Depth (ft)	0-1	4-5	0-1	4-5	9-10	0-1	4-5	0-1	4-5	0-1	4-5	0-1	4-5
Geologic Material	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt
AIR MONITORING													
PID*	BKD	BKD	BKD	BKD	BKD	BKD	BKD	BKD	1.8	BKD	BKD	BKD	BKD
SOIL CHEMISTRY													
Volatiles (µg/g)	NA	NA	NA	NA	BDL	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatiles (µg/g)													
None Detected													
Metals (µg/g)													
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	20	14	19	17	9.4	16	13	17	14	18	9.9	14	BDL
Copper	14	12	14	13	8.2	16	13	13	9.1	14	29	10	31
Lead	32	20	34	26	BDL	24	24	30	BDL	29	32	26	BDL
Zinc	59	47	60	48	32	53	47	53	34	54	77	59	60
Arsenic (µg/g)	BDL	5.8	7.1	6.7	BDL	7.4	6.8	BDL	BDL	BDL	BDL	BDL	BDL
Mercury (µg/g)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 30-1-2. Concentration of Target Analytes Above Detection Limits in Site 30-1 Soil Samples (Page 2 of 6)

Bore Number Depth (ft) Geologic Material	5331 0-1 Slightly Sandy Silt	5331 4-5 Sandy Silt	5332 0-1 Slightly Sandy Silt	5332 4-5 Sandy Silt	5333 0-1 Clayey Silt	5333 4-5 Clayey Silt	5333 9-10 Clayey Silt	5334 0-1 Silty Sand	5334 4-5 Silty Sand	5334 9-10 Weathered Volcani-clastic (Denver Fm.)	5335 0-1 Sandy Silt	5335 4-5 Sandy Silt	5335 9-10 Weathered Claystone (Denver Fm.)
AIR MONITORING													
PID*	BKD	BKD	BKD	BKD	BKD	BKD	BKD	BKD	2.0	2.3	1.3	0.9	BKD
SOIL CHEMISTRY													
Volatiles (µg/g)													
	NA	NA	NA	NA	NA	NA	NA	NA	NA	BDL	NA	NA	BDL
Semivolatiles (µg/g)													
None Detected													
Metals (µg/g)													
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	11	17	19	16	18	21	18	12	BDL	BDL	15	BDL	BDL
Copper	15	20	21	19	12	14	11	11	5.8	36	13	36	36
Lead	BDL	BDL	BDL	BDL	32	34	28	BDL	BDL	30	20	32	31
Zinc	42	55	66	50	50	61	47	40	26	93	50	83	84
Arsenic (mg/g)	BDL	BDL	BDL	BDL	BDL	6.4	5.5	BDL	BDL	BDL	5.9	BDL	BDL
Mercury (µg/g)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 30-1-2. Concentration of Target Analytes Above Detection Limits in Site 30-1 Soil Samples (Page 3 of 6)

Bore Number	5336	5336	5337	5337	5338	5338	5339	5339	5340	5340	5341	5341	5341
Depth (ft)	0-1	4-5	0-1	4-5	0-1	4-5	0-1	4-5	0-1	4-5	0-1	4-5	9-10
Geologic Material	Slightly Clayey Silt	Sandy Silt	Sand	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Weathered Volcani-clastic
AIR MONITORING													
PID*	BKD	BKD	BKD	BKD	BKD	BKD	0.7	BKD	BKD	BKD	BKD	BKD	BKD
SOIL CHEMISTRY													
Volatiles (µg/g)													
	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Semivolatiles (µg/g)													
None Detected													
Metals (µg/g)													
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	16	9.9	BDL	14	15	BDL	18	16	18	16	21	12	13
Copper	18	13	9.4	13	14	15	15	15	14	14	24	51	58
Lead	21	BDL	BDL	BDL	26	29	30	28	32	28	BDL	BDL	26
Zinc	60	37	BDL	48	52	88	58	56	56	56	69	110	89
Arsenic (µg/g)	BDL	BDL	BDL	BDL	5.8	BDL	BDL	BDL	BDL	6.3	BDL	BDL	BDL
Mercury (µg/g)	BDL	BDL	BDL	BDL	BDL	0.066	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 30-1-2. Concentration of Target Analytes Above Detection Limits in Site 30-1 Soil Samples (Page 4 of 6)

Bore Number	5342	5342	5343	5343	5344	5344	5345	5345	5345	5346	5346	5347	5347
Depth (ft)	0-1	4-5	0-1	4-5	0-1	4-5	0-1	4-5	9-10	0-1	4-5	0-1	4-5
Geologic Material	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Weathered Volcani-clastic (Denver Fm.)	Sandy Silt	Sandy Silt	Slightly Clayey Silt	Clayey Silt
AIR MONITORING													
PID*	BKD	BKD	BKD	BKD	BKD	BKD	BKD	BKD	1.3	0.7	BKD	BKD	BKD
SOIL CHEMISTRY													
Volatiles (µg/g)	NA	NA	NA	NA	NA	NA	NA	NA	BDL	NA	NA	NA	NA
Semivolatiles (µg/g)													
None Detected													
Metals (µg/g)													
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	19	9.4	16	8.1	20	19	16	BDL	BDL	10	10	9.6	16
Copper	21	12	20	7.0	19	20	20	39	26	14	12	14	19
Lead	BDL	BDL	26	BDL	31	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Zinc	66	42	50	33	68	54	50	92	65	35	42	33	58
Arsenic (µg/g)	BDL	BDL	5.9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Mercury (µg/g)	BDL	BDL	BDL	BDL	BDL	0.066	BDL	BDL	0.082	BDL	BDL	BDL	BDL

Table 30-1-2. Concentration of Target Analytes Above Detection Limits in Site 30-1 Soil Samples (Page 5 of 6)

Bore Number	5348	5348	5348	5349	5349	5350	5350	5350
Depth (ft)	0-1	4-5	9-10	0-1	4-5	0-1	4-5	9-10
Geologic Material	Sandy Silt	Sandy Silt	Silty Sand	Slightly Clayey Silt	Slightly Clayey Silt	Sandy Silt	Sandy Silt	Sandy Silt
AIR MONITORING								
PID*	BKD	BKD	BKD	BKD	BKD	1.1	BKD	BKD
SOIL CHEMISTRY								
Volatiles (µg/g)								
	NA	NA	BDL	NA	NA	NA	NA	NA
Semivolatiles (µg/g)								
None Detected								
Metals (µg/g)								
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	17	11	9.4	15	14	22	14	11
Copper	17	13	6.3	18	18	13	10	7.8
Lead	29	21	BDL	BDL	20	33	21	BDL
Zinc	58	42	74	59	50	61	44	32
Arsenic (µg/g)	BDL	BDL	BDL	BDL	BDL	6.5	BDL	BDL
Mercury (µg/g)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 30-1-2. Concentration of Target Analytes Above Detection Limits in Site 30-1 Soil Samples (Page 6 of 6)

Bore Number	5351	5351	5352	5352	5353	5353
Depth (ft)	0-1	4-5	0-1	4-5	0-1	4-5
Geologic Material	Sandy Silt	Silty Sand	Clayey Silt	Clayey Silt	Sandy Silt	Sandy Silt
AIR MONITORING						
PID*	1.5	1.9	BKD	BKD	BKD	BKD
SOIL CHEMISTRY						
Volatiles (µg/g)						
	NA	NA	NA	NA	NA	NA
Semivolatiles (µg/g)						
None Detected						
Metals (µg/g)						
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL
Chromium	14	11	21	25	17	11
Copper	9.4	8.6	13	14	17	13
Lead	24	20	41	36	BDL	BDL
Zinc	44	45	64	64	44	43
Arsenic (µg/g)	BDL	BDL	5.9	6.2	BDL	BDL
Mercury (µg/g)	BDL	BDL	BDL	BDL	BDL	BDL

* As calibrated to an isobutylene standard.
BKD No readings above ambient background.
NA Not analyzed.
BDL Below detection limit.

Source: ESE, 1987.

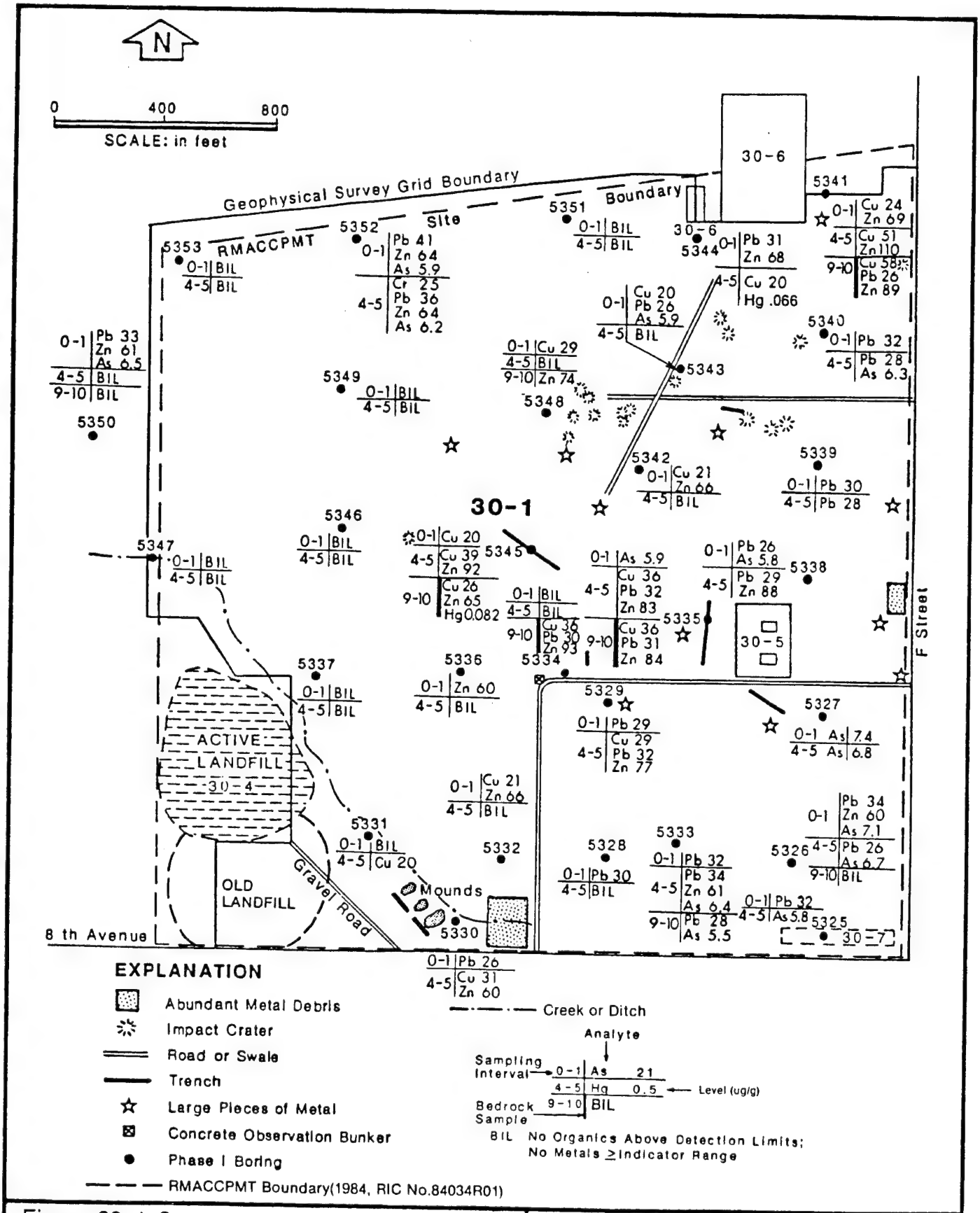

Figure 30-1-8
PHASE I INVESTIGATION
CHEMICAL ANALYSIS RESULTS
SITE 30-1
SOURCE: HLA 1987

Prepared for:
U.S. Army Program Manager's Office For Rocky Mountain Arsenal
Aberdeen Proving Ground, Maryland

Several compounds were detected by GC/MS that were not included in the target compound list and that were not conclusively identified. Table 30-1-3 lists the boring number, sample interval depth, relative retention time (shown as "unknown number" on the table), concentration, sample number, lot best-fit identification, and comments for these nontarget compounds detected at Site 30-1. It should be noted that an individual compound may have more than one relative retention time and also that a particular retention time may be assigned to more than one compound. Therefore, Table 30-1-3 provides only a general indication of additional compounds that may be present.

Ninety-seven nontarget identifications were recorded and 45 sample intervals were found to contain nontarget compounds at concentrations ranging from 0.3 to 7 ppm. Most of these compounds were tentatively identified as naturally-occurring semivolatile organic compounds. Phthalates were detected in three samples, and oxybis ethanol (diethylene glycol) was detected in three others. Thirty-five nontargets were detected at low levels and could not be identified.

The nontarget data were reviewed and assessed with respect to the site's historical use. The compounds identified are attributable to naturally-occurring degradation products. The 2,2-(1,2 ethane diyl-bis) oxybis ethanol was the only exception. Oxybis ethanol (diethylene glycol) is a common component in antifreeze. Although this compound only occurred in Lot BMS, no positive identification of oxybis ethanol could be made from the method blank nontarget analysis. It should be noted, however, that all Task 14 borings where oxybis ethanol was detected were drilled in the winter months. In the field, antifreeze is put in the steam cleaner overnight during winter months, and bled out of the lines before decontamination procedures. It is thought that incomplete bleeding of the line contaminated drilling equipment with antifreeze, and likewise, samples from these borings. The remaining unknown compounds all occurred at low concentrations and are probably related to the natural environment rather than chemical contamination.

Table 30-1-3. Tentative Identification of Nontarget Compounds in Site 30-1 Soil Samples (Page 1 of 5)

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration Above Background (ppm)*	Sample Number	Lot	Best Fit	Comments†
5325	0-1	625	0.8	30-1-1	BMT	Phthalate	a,c,g,h
		626	1	30-1-1	BMT	Phthalate	a,d,g,h
		628	0.6	30-1-1	BMT	Phthalate	a,c,g,h
		631	0.5	30-1-1	BMT	Octadecanol	d
		634	0.4	30-1-1	BMT	Unknown	a
		636	6	30-1-1	BMT	Bis (2-ethyl-hexyl) phthalate	c
		642	0.9	30-1-1	BMT	Unknown hydrocarbon	a,f,g,h
	4-5			30-1-2	BMU		i
5326	0-1			30-1-12	BMU		i
	4-5			30-1-13	BMU		i
	9-10	027	3	30-1-14	BMU		
		614	2	30-1-14	BMU	Dibutyl ester nonanedioic acid	d
5327	0-1	615	0.4	30-1-23	BMT	Unknown	a
		634	0.9	30-1-23	BMT	Unknown hydrocarbon	a,f,g
		642	0.6	30-1-23	BMT	Unknown	a
	4-5	642	0.4	30-1-24	BMT	Unknown	a
5328	0-1			30-1-34	BMU		i
	4-5			30-1-35	BMU		i
5329	0-1	566	0.4	30-1-35	BMU	Unknown	a
		606	0.4	30-1-35	BMU	Methyl ester hexadecanoic acid	d,f
	4-5	633	0.6	30-1-36	BMV	Unknown	a
5330	0-1	609	0.5	30-1-56	MPH	Hexadecanoic acid	d
		611	0.5	30-1-56	MPH	Unknown hydrocarbon	a,d,f
		617	0.7	30-1-56	MPH	Unknown	a
		618	0.5	30-1-56	MPH	Unknown	a
		619	0.5	30-1-56	MPH	Unknown	a

Table 30-1-3. Tentative Identification of Nontarget Compounds in Site 30-1 Soil Samples (Page 7 of 5)

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration Above Background (ppm)*	Sample Number	Lot	Best Fit	Comments†
5330	0-1	628	0.8	30-1-57	MPH	Unknown	a
		634	0.7	30-1-57	MPH	Unknown	a,f
		642	0.6	30-1-57	MPH	Unknown	a,f
		652	0.7	30-1-57	MPH	Unknown hydrocarbon	a,f
5330	4-5	634	1	30-1-57	MPH	Unknown hydrocarbon	a
		637	0.8	30-1-57	MPH	Bis (2-ethyl-hexyl) phthalate	c,f
5331	0-1	588	3	30-1-67	MPD	Diethyl phthalate	c
	4-5	634	0.5	30-1-68	MPD	Unknown hydrocarbon	a,f
5332	0-1	634	0.9	30-1-78	MPE	Unknown hydrocarbon	a,f
	4-5	634	0.7	30-1-79	MPE	Unknown hydrocarbon	a,f
5333	0-1	620	0.4	30-1-89	BMV	Unknown	a
		634	0.4	30-1-89	BMV	Unknown	a
		642	0.3	30-1-89	BMV	Unknown	a
	4-5			30-1-90	BMV		i
	9-10	614	2	30-1-91	BMV	Dibutyl ester nonanedioic acid	d
5334	0-1	634	0.4	30-1-100	BMT	Unknown hydrocarbon	a,f,g
		642	0.4	30-1-100	BMT	Unknown	a
	4-5			30-1-101	BMT		i
	9-10			30-1-102	BMT		i
5335	0-1	582	0.4	30-1-111	BMS	Unknown	a
		614	6	30-1-111	BMS	Octadecanol	d
		615	0.4	30-1-111	BMS	Unknown	a
		642	0.5	30-1-111	BMS	Unknown	a
		650	0.5	30-1-111	BMS	Unknown	a

Table 30-1-3. Tentative Identification of Nontarget Compounds in Site 30-1 Soil Samples (Page 3 of 5)

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration Above Background (ppm)*	Sample Number	Lot	Best Fit	Comments†
5335	4-5	582	0.5	30-1-112	BMS	2,2' (1,2 Ethane diyl-bis) oxybis ethanol	f
		614	7	30-1-112	BMS	Octadecanol	d
		623	0.5	30-1-112	BMS	Unknown	a
	9-10	550	0.5	30-1-113	BMS	Heptanoic acid	d
		614	2	30-1-113	BMS	Octadecanol	d
5336	0-1	634	0.3	30-1-122	MPE	Unknown hydrocarbon	a,f
	4-5	615	1	30-1-123	MPE	Dibutyl nonanedioate	d
		634	0.6	30-1-123	MPE	Unknown hydrocarbon	a,f
5337	0-1	634	1	30-1-133	MPG	Unknown hydrocarbon	a
	4-5			30-1-134	MPG		j
5338	0-1	562	0.4	30-1-144	BMS	Unknown	a
		582	0.8	30-1-144	BMS	2,2' (1,2 Ethane diyl-bis) oxybis ethanol	f
		614	4	30-1-144	BMS	Octadecanol	d
		615	0.6	30-1-144	BMS	Unknown	a
		634	0.5	30-1-144	BMS	Unknown	a
		642	0.6	30-1-144	BMS	Unknown	a
	4-5	614	2	30-1-145	BMS	Octadecanol	d
5339	0-1	559	0.4	30-1-155	BMS	Unknown	a
		562	0.6	30-1-155	BMS	Unknown	a
		566	0.7	30-1-155	BMS	Nonanoic acid	d
		582	0.9	30-1-155	BMS	2,2' (1,2 Ethane diyl bis) oxybis ethanol	f
		614	5	30-1-155	BMS	Octadecanol	d
		615	0.6	30-1-155	BMS	Octadecanol	d
		634	0.5	30-1-155	BMS	Unknown hydrocarbon	a,f
		642	0.6	30-1-155	BMS	Unknown	a
	4-5	614	4	30-1-156	BMS	Octadecanol	d
		642	0.4	30-1-156	BMS	Unknown	a
5340	0-1	614	2	30-1-166	BMS	Octadecanol	d
		634	0.5	30-1-166	BMS	Unknown hydrocarbon	a,f

Table 30-1-3. Tentative Identification of Nontarget Compounds in Site 30-1 Soil Samples (Page 4 of 5)

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration Above Background (ppm)*	Sample Number	Lot	Best Fit	Comments†
5340	4-5	614	2	30-1-167	BMS	Octadecanol	d
		642	0.6	30-1-167	BMS	Unknown hydrocarbon	a, f
5341	0-1			30-1-177	MPB		j
	4-5	615	3	30-1-178	MPB	Dibutyl nonanedioate	d
	9-10	615	1	30-1-179	MPB	Unknown hydrocarbon	a
5342	0-1	634	0.9	30-1-188	MPG	Unknown hydrocarbon	a, f
	4-5	634	0.9	30-1-189	MPG	Unknown hydrocarbon	a, f
5343	0-1	642	0.8	30-1-199	BMS	Unknown	a
		650	0.4	30-1-199	BMS	Unknown	a
	4-5	614	6	30-1-200	BMS	Octadecanol	d
		633	0.9	30-1-200	BMS	Unknown	a
5344	0-1	582	0.9	30-1-210	MPB	Unknown hydrocarbon	a, f
	4-5			30-1-211	MPB		i
5345	0-1			30-1-221	MPH		i
	4-5	634	0.7	30-1-222	MPG	Unknown hydrocarbon	a, f
	9-10	634	1	30-1-223	MPG	Unknown hydrocarbon	a
5346	0-1			30-1-232	MPH		j
	4-5	615	0.4	30-1-233	MPH	Dibutyl nonanedioate	d
5347	0-1	635	0.8	30-1-243	MPE	Unknown hydrocarbon	a, f
	4-5	634	0.7	30-1-244	MPE	Unknown hydrocarbon	a, f
5348	0-1			30-1-254	MPB		i
	4-5			30-1-255	MPB		i

Table 30-1-3. Tentative Identification of Nontarget Compounds in Site 30-1 Soil Samples (Page 5 of 5)

Borehole Number	Interval Depth (ft)	Unknown Number	Concentration Above Background (ppm)*	Sample Number	Lot	Best Fit	Comments†
5348	9-10	094	0.2	30-1-256	MLS	Unknown hydrocarbon	a,f
		615	1	30-1-256	MLS	Dibutyl nonanedioate	d
5349	0-1	635	1	30-1-265	MPE	Unknown hydrocarbon	a
	4-5			30-1-266	MPE		i
5350	0-1			30-1-276	BMU		i
	4-5			30-1-277	BMU		i
	9-10	614	0.4	30-1-278	BMU	Unknown	a
5351	0-1			30-1-287	BMT		i
	4-5	633	0.4	30-1-288	BMT	Unknown	a
5352	0-1	642	0.4	30-1-298	BMV	Unknown	a
	4-5	648	0.4	30-1-299	BMV	Unknown	a
5353	0-1			30-1-309	MPH		i
	4-5	634	1	30-1-310	MPG	Unknown hydrocarbon	a

* Values reported are blank corrected.

† a. No positive identification.
b. Surfactant.
c. Plasticizer (note: All phthalates and adipates will have this comment).
d. Derived from natural products.
e. Suspected laboratory contaminant.
f. Low concentration.
g. Low frequency of occurrence.
h. Ubiquitous.
i. Possible column bleed.
j. None detected.

Source: ESE, 1987.

Although two of six borings (5335 and 5345) were in trenches suspected of containing contamination, only Sample 5345 (9- to 10-ft) was visibly stained with green specks and spots. Copper, zinc, and mercury were detected in this sample at concentrations within their respective indicator ranges. Many other samples with no visible discoloration contained similar metal values.

3.2.5 Phase I Contamination Assessment

A significant portion of Site 30-1 is underlain by relatively shallow (6- to 9-ft) bedrock which influenced metal concentration values in 4- to 5- and 9- to 10-ft sample intervals. Bedrock (Denver Formation) samples usually displayed copper, zinc, and other metals at concentrations within and above their indicator range depending on lithology. Consequently, metal values from deep samples must be evaluated with regard to lithologic variations. It should be noted that established indicator ranges are based on metal values for surficial alluvium (0- to 5-ft) and do not necessarily reflect geochemical variations between alluvial and bedrock environments. Except for an elevated lead value in the 0- to 1-ft interval of Borehole 5352, 4- to 5- and 9- to 10-ft are the only other intervals where metal values were detected above the indicator ranges.

Copper, lead, and zinc were detected at levels above their indicator ranges in 13 samples (6 boreholes) collected within or slightly above the weathered or slightly reworked bedrock zone or within a brown silty-clay horizon. These six borings are located within the broad curving band of out-of-phase EM anomalies. This conductivity band is represented by shallow (<10 ft) volcaniclastic bedrock, as evidenced by seven borings logged for geologic horizons. The presence of shallow bedrock is further indicated by several Site 30-5 Phase I borings that encountered bedrock at 3- to 4-ft (Figure 30-1-6), and borings from Site 30-6 which displayed similar geochemical patterns.

Boring 5345 was noted to contain green specks in the 9- to 10-ft sample. The cause of this green coloration was not determined; however, metal concentrations were within or below indicator level for this bedrock sample. No volatile or semivolatile compounds were detected in this sample.

The north-south oriented trench containing Boring 5335 is within a widespread magnetic and electromagnetic anomaly. No geophysical response was directly related to the trench, and Boring 5335 contained metal concentrations indicative of shallow bedrock rather than trench disposal.

A possible burn area was noted by Stout et al. (1982, RIC#83368R01) in their aerial photograph interpretation of the eastern site boundary. This area corresponds to an area of scattered metal debris, scattered clay building tiles, and bricks. Historical information indicates an agricultural use silo once stood at this location, and the debris is thought to be the result of its demolition. A Phase II boring is suggested to provide more information on activity at this location.

A pit was excavated at geophysical Anomaly C to explain the intense magnetic and electro-magnetic response. Geologists logging the pit identified bedrock at 8 ft, and no evidence of disposal activity was observed. A trench cut across a similar anomaly in Site 30-6 also identified shallow bedrock as cause for the geophysical responses. No further investigation is required in this area.

Geophysical results for the trenches just west of Boring 5330 (Anomaly D, Figure 30-1-7) strongly suggest the presence of buried metal debris. Some of the highest in-phase and out-of-phase EM values in Site 30-1 were found in this area. The mounds associated with these trenches are outside the area of high magnetic and in-phase intensities, and no visible evidence of debris is present. Bedrock influences for Anomaly D are probably insignificant relative to Anomalies B and C. Additional borings in these trenches are suggested on the basis of the geophysical response and observed debris in and around Anomaly D. The mounds east of the trenches display no discrete geophysical response and contain no visible debris or indication of contamination. The mounds are most likely the original excavation material and do not warrant further investigation

A large area underlain by volcaniclastic material in the bedrock was delineated by the magnetic technique and, to a lesser degree, by in-phase EM. This area (Anomaly B) extends east of the site boundary into the

southwestern portion of Site 29-4. The elevated copper, lead, and zinc values found in samples from this anomaly are related to the erratic deposition of metals caused by the weathering and reworking of the Denver Formation.

The following three areas at Site 30-1 have not been fully explored or defined by the Phase I investigation. A Phase II investigation is warranted for these areas:

- o Geophysical Anomaly D, which is centered on the trenches in the south - central portion of the site;
- o The trench investigated by Boring 5335; and
- o The small area of demolition and metal debris identified as a burn scar along the eastern site boundary.

3.3 PHASE II SURVEY

A Phase II program will be conducted at this site to examine the following three areas:

- o Two 10 ft borings will investigate geophysical Anomaly D for any chemical compounds related to the strong geophysical anomalies in the two trenches. Samples will be taken from the intervals of 0 to 1, 4 to 5, and 9 to 10 ft and analyzed for the Phase I suite of analytes. An isopropylmethyl phosphonate (IMPA) and thiodiglycol (TDG) analysis will be conducted on all samples to test for Army agent degradation products. The deepest interval will also be analyzed for volatile organic compounds, or in other intervals as necessitated by field conditions;
- o The trench investigated by Boring 5335 will be investigated by two additional borings: one placed to the north and one placed south of Boring 5335 (Figure 30-1-9). These 10 ft borings will be sampled at the intervals of 0 to 1, 4 to 5, and 9 to 10 ft and analyzed for the Phase I suite. An IMPA and TDG analysis will also be conducted on all samples to test for Army agent degradation products. Volatile organic compounds will be analyzed on the deepest interval in each boring and in samples as necessitated by field conditions; and

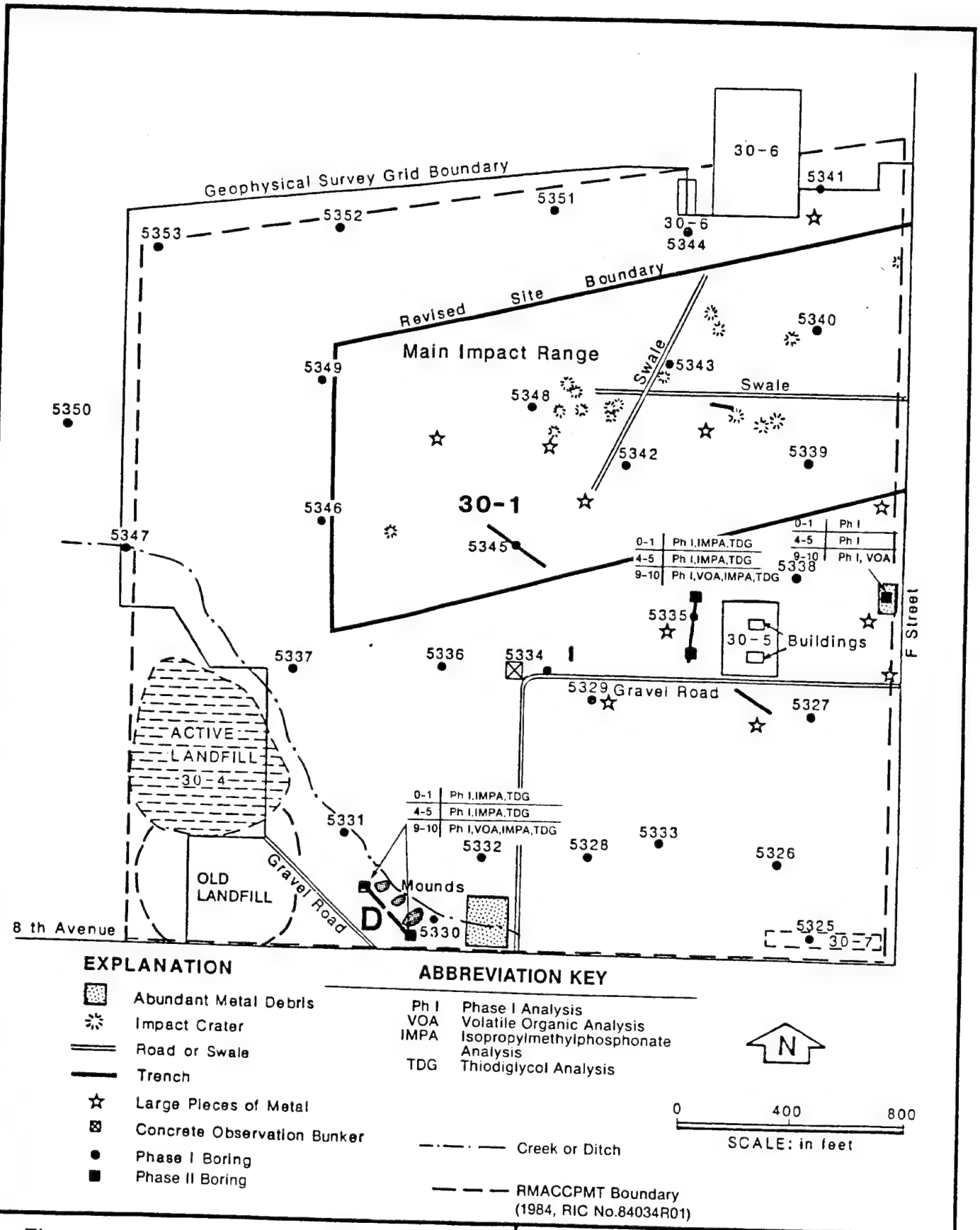

Figure 30-1-9
PROPOSED PHASE II INVESTIGATION
BORING LOCATION MAP, SITE 30-1
SOURCE: HARDING LAWSON ASSOCIATES

Prepared for:
U.S. Army Program Manager's Office
For Rocky Mountain Arsenal
Aberdeen Proving Ground, Maryland

- A possible burn area noted by Stout et al. (1982, RIC#83368R01) and mapped by geophysicists as an area of abundant surface metal (Figure 30-1-7) will be investigated by a single 10-ft boring with the intervals of 0 to 1, 4 to 5, and 9 to 10 ft analyzed for Phase I analytes. This area is thought to be the demolition remains of a farming silo based on historical information and visual inspection. The deepest sample interval from this boring will also be analyzed for volatile organic compounds.

In summary, 5 borings (20 samples) are recommended for the Phase II program. Following this program, site boundaries will be further modified and new volume/area estimates will be calculated.

Comments on the draft final version of this report were received from Shell Chemical Company on July 1, 1987 and from Colorado Department of Health on October 27, 1987. Additional comments were received from the U.S. Environmental Protection Agency on October 29, 1987. These comments were considered in the preparation of this final report and are presented with responses in Appendix 30-1-C.

3.4 QUANTITY OF POTENTIALLY CONTAMINATED SOIL

The Decontamination Assessment Report (RMACCPMT, 1984, RIC#84034R01) outlined a hypothetical cleanup strategy for Site 30-1. The plan called for the excavation and removal of 241,000 bank cubic yards (bcy) of material. The estimated depth of excavation was 6 ft. UXO and contaminated soil were assumed to account for 0.1 and 15 percent of the total volume, respectively (RMACCPMT, 1984, RIC#84034R01).

Phase I field observations suggest that a large part of Site 30-1 is affected by metal associated with mortar impacts. Metal debris is thought to be less abundant outside the primary impact area. The main impact range should include a relatively small amount of potentially contaminated soil

relative to its overall size; nevertheless, excavation will be necessary to remove buried mortar fragments and/or UXO. Although the volume of fragments and UXO is probably small (i.e.; a few cubic yards), a significant amount of soil would have to be screened to find it.

The areal extent of the geophysical anomaly, trench, and burn scar have been estimated as 10,500, 7,000, and 20,000 ft^2, respectively. Assuming a 6-ft depth, the volume of potentially contaminated soils for these areas is 8,400 bcy.

The revised site boundary for the main impact range is shown in Figure 30-1-9. This area occupies 2,100,000 ft^2 and is estimated to contain 70,000 bcy of hazardous waste and 470 bcy of UXO, on the basis of a 6-ft excavation depth and criteria in the Decontamination Assessment Report (RMACCPMT, 1984, RIC#84034R01). These estimates are speculative and will remain so until further information is available on the type, quantity, and depth of potentially contaminated debris.

4.0 REFERENCES

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APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

PHASE I ANALYTES AND CERTIFIED METHODS

Analytes/Methods	Synonymous Names and Abbreviations	Standard Abbreviations
VOLATILE ORGANIC COMPOUNDS/GCMS	VOL	VO
1,1-Dichloroethane	1,1-Dichloroethane	11DCLE
1,2-Dichloroethane	1,2-Dichloroethane	12DCLE
1,1,1-Trichloroethane (TCA)	1,1,1-Trichloroethane	111TCE
1,1,2-Trichloroethane	1,1,2-Trichloroethane	112TCE
Benzene	Benzene	C_6H_6
Bicycloheptadiene	Bicycloheptadiene (BCHD)	BCHPD
Carbon tetrachloride	Carbon tetrachloride	CCL_4
Chlorobenzene	Chlorobenzene	CLC_6H_5
Chloroform	Chloroform	$CHCL_3$
Dibromochloropropane	Dibromochloropropane	DBCP
Dicyclopentadiene	Dicyclopentadiene	DCPD
Dimethyldisulfide	Dimethyldisulfide	DMDS
Ethylbenzene	Ethylbenzene	ETC_6H_5
m-Xylene	meta-Xylene	13DMB
Methylene chloride	Methylene chloride	CH_2CL_2
Methylisobutyl ketone	Methylisobutyl ketone	MIBK
o,p-Xylene	ortho- and/or para-Xylene	XYLEN
Tetrachloroethene (PCE)	Tetrachloroethylene	TCLEE
Toluene	Toluene	MEC_6H_5
Trans 1,2-dichloroethene	Trans 1,2-dichloroethylene	12DCE
Trichloroethene (TCE)	Trichloroethylene	TRCLE
SEMIVOLATILE ORGANIC COMPOUNDS/GCMS	EXTRACTABLE ORGANIC COMPOUNDS (EX)	SVO
1,4-Oxathiane	1,4-Oxathiane	OXAT
2,2-Bis (para-chlorophenyl)-1,1-dichloroethane	Dichlorodiphenylethane	PPDDE
2,2-Bis (para-chlorophenyl) 1,1,1-trichloroethane	Dichlorodiphenyltrichloroethane	PPDDT
Aldrin	Aldrin	ALDRN
Atrazine	Atrazine	ATZ
Chlordane	Chlordane	CLDAN
Chlorophenylmethyl sulfide	p-Chlorophenylmethyl sulfide	CPMS
Chlorophenylmethyl sulfoxide	p-Chlorophenylmethyl sulfoxide	CPMSO
Chlorophenylmethyl sulfone	p-Chlorophenylmethyl sulfone	$CPMSO_2$
Dibromochloropropane	Dibromochloropropane	DBCP
Dicyclopentadiene	Dicyclopentadiene	DCPD
Dieldrin	Dieldrin	DLDRN
Diisopropylmethyl phosphonate	Diisopropylmethyl phosphonate	DIMP

APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

Analytes/Methods	Synonymous Names and Abbreviations	Standard Abbreviations
SEMIVOLATILE ORGANIC COMPOUNDS (CONT)		
Dimethylmethyl phosphonate	Dimethylmethyl phosphonate	DMMP
Dithiane	Dithiane	DITH
Endrin	Endrin	ENDRN
Hexachlorocyclopentadiene	Hexachlorocyclopentadiene (HCPD)	CL_6CP
Isodrin	Isodrin	ISODR
Malathion	Malathion	MLTHN
Parathion	Parathion	PRTHN
Supona	2-Chloro-1(2,4-dichlorophenyl) vinyldiethyl phosphate	SUPONA
Vapona	Vapona	DDVP
METALS/ICP	ICAP	ICP
Cadmium	Cadmium	CD
Chromium	Chromium	CR
Copper	Copper	CU
Lead	Lead	PB
Zinc	Zinc	ZN
SEPARATE ANALYSES		
Arsenic/AA	Arsenic	AS
Mercury/AA	Mercury	HG

APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

PHASE II ANALYTES AND CERTIFIED METHODS

Analytes/Methods	Synonymous Names and Abbreviations	Standard Abbreviations
VOLATILE ORGANIC COMPOUNDS/GCMS (Same as Phase I)	VOL	VO
SEMIVOLATILE ORGANIC COMPOUNDS/GCMS (Same as Phase I)	EXTRACTABLE ORGANIC COMPOUNDS (EX)	SVO
VOLATILE HALOCARBON COMPOUNDS/GCCON	PURGEABLE HALOCARBONS (PHC)	VHO
1,1-Dichloroethane	1,1-Dichloroethane	11DCLE
1,2-Dichloroethane	1,2-Dichloroethane	12DCLE
1,1-Dichloroethene	1,1-Dichloroethene	11DCE
1,1,1-Trichloroethane (TCA)	1,1,1-Trichloroethane	111TCE
1,1,2-Trichloroethane	1,1,2-Trichloroethane	112TCE
Carbon tetrachloride	Carbon tetrachloride	CCL_4
Chlorobenzene	Chlorobenzene	CLC_6H_5
Chloroform	Chloroform	$CHCL_3$
Methylene chloride	Methylene chloride	CH_2CL_2
Trans 1,2-dichloroethylene	Trans 1,2-dichloroethene	12DCE
Tetrachloroethene (PCE)	Tetrachloroethylene	TCLEE
Trichloroethene (TCE)	Trichloroethylene	TRCLE
VOLATILE HYDROCARBON COMPOUNDS/GCFID	DCPD	HYDCBN
Bicycloheptadiene	Bicycloheptadiene (BCHD)	BCHPD
Dicyclopentadiene	Dicyclopentadiene	DCPD
Methylisobutyl ketone	Methylisobutyl ketone	MIBK
VOLATILE AROMATIC COMPOUNDS/GCPID	PURGEABLE AROMATICS (PAM)	VAO
Benzene	Benzene	C_6H_6
Ethylbenzene	Ethylbenzene	ETC_6H_5
m-Xylene	meta-Xylene	13DMB
o,p-Xylene	ortho- and/or para-Xylene	XYLEN
Toluene	Toluene	MEC_6H_5
ORGANOCHLORINE PESTICIDES/GCEC		OCP
2,2-Bis (para-chlorophenyl)-1,1-dichloroethane	Dichlorodiphenylethane	PPDDE
2,2-Bis (para-chlorophenyl)-1,1,1-trichloreoethane	Dichlorodiphenyltrichloroethane	PPDDT
Aldrin	Aldrin	ALDRN
Chlordane	Chlordane	CLDAN
Dieldrin	Dieldrin	DLDRN
Endrin	Endrin	ENDRN
Hexachlorocyclopentadiene	Hexachlorocyclopentadiene	CL_6CP
Isodrin	Isodrin	ISODR

APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

Analytes/Methods	Synonymous Names and Abbreviations	Standard Abbreviations
ORGANOPHOSPHOROUS PESTICIDES/GCNPD	ORGANOPHOSPHOROUS COMPOUNDS (OPC)	OPP
Atrazine	Atrazine	ATZ
Malathion	Malathion	MLTHN
Parathion	Parathion	PRTHN
Supona	2-Chloro-1(2,4-dichlorophenyl) vinyldiethyl phosphate	SUPONA
Vapona	Vapona	DDVP
ORGANOPHOSPHOROUS COMPOUNDS/GCFPD	DIMP	OPC
Diisopropylmethyl phosphonate	Diisopropylmethyl phosphonate	DIMP
Dimethylmethyl phosphonate	Dimethylmethyl phosphonate	DMMP
ORGANOSULPHUR COMPOUNDS/GCFPD		OSC
1,4-Oxathiane	1,4-Oxathiane	OXAT
Benzothiazole	Benzothiazole	BTZ
Chlorophenylmethyl sulfide	p-Chlorophenylmethyl sulfide	CPMS
Chlorophenylmethyl sulfone	p-Chlorophenylmethyl sulfone	$CPMSO_2$
Chlorophenylmethyl sulfoxide	p-Chlorophenylmethyl sulfoxide	CPMSO
Dimethyldisulfide	Dimethyldisulfide	DMDS
Dithiane	Dithiane	DITH
METALS/ICP	ICAP	ICP
Cadmium	Cadmium	CD
Chromium	Chromium	CR
Copper	Copper	CU
Lead	Lead	PB
Zinc	Zinc	ZN
SEPARATE ANALYSES		
Arsenic/AA	Arsenic	AS
Mercury/AA	Mercury	HG

APPENDIX 30-1-A
CHEMICAL NAMES, METHODS, AND ABBREVIATIONS

Analytes/Methods	Synonymous Names and Abbreviations	Standard Abbreviations
ARMY AGENT DECRADATION PRODUCTS:		ADP
AGENT PRODUCTS/HPLC	TDGCL	
Chloroacetic Acid	Chloroacetic acid	CLC2A
Thiodiglycol	Thiodiglycol (TDG)	TDGCL
AGENT PRODUCTS/IONCHROM	IMPA	GBDP
Fluoroacetic acid	Fluoroacetic acid	FC2A
Isopropylmethylphosphonic acid	Isopropylmethylphosphonate	IMPA
Methylphosphonic acid	Methylphosphonate	MPA

Methods	Abbreviations
Atomic Absorption Spectroscopy	AA
Gas Chromatography/Conductivity Detector	GCCON
Gas Chromatography/Electron Capture	GCEC
Gas Chromatography/Flame Ionization Detector	GCFID
Gas Chromatography/Flame Photometric	GCFPD
Gas Chromatography/Mass Spectrometry	GCMS
Gas Chromatography/Nitrogen Phosphorous Detector	GCNPD
Gas Chromatography/Photoionizaton Detector	GCPID
High Performance Liquid Chromatography	HPLC
Inductively Coupled Argon Plasma	ICP, ICAP
Ion Chromatography	IONCHROM

APPENDIX 30-1-B
PHASE I CHEMICAL DATA

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# 5325A	5325B	5326A	5326B	5326C	5327A	5327B	5328A	5328B	5329A	5329B	5330A	5330B	5331A
UNITS	METHOD	30-1 1	30-1 2	30-1 12	30-1 13	30-1 14	30-1 23	30-1 24	30-1 34	30-1 35	30-1 45	30-1 46	30-1 56	30-1 57	30-1 67
DATE		03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/28/86	04/11/86	04/11/86	04/02/86
TIME		08:21	08:21	09:40	09:40	09:40	00:00	00:00	10:40	10:40	10:14	10:14	14:10	14:10	10:37
SAMPLE TYPE	71999 0	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE DEPTH	99758A 0	0.0	4.00	0.0	4.00	9.00	0.0	4.00	0.0	4.00	0.0	4.00	0.0	4.00	0.0
FT															
SITE TYPE I	99759 0	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
INSTALLATION CODE	99720 0	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK
SAMPLE															
SAMPLING TECHNIQUE	72005 0	S	S	S	S	S	S	S	S	S	S	S	S	S	S
COORDINATE,N/S	98392 0	186050	186050	186302	186302	186302	186827	186827	186309	186309	186867	186867	186073	186073	186362
STP															
COORDINATE,E/W	98393 0	2193659	2193659	2193538	2193538	2193538	2193638	2193638	2192886	2192886	2192886	2192886	2192372	2192372	2192020
STP															
MOISTURE	70320 0	11.1	10.7	9.8	7.7	7.4	12.8	7.4	8.9	7.0	10.0	13.1	16.5	10.7	8.0
%WET WT															
CADMIUM	1028 0	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.510	<0.510	<0.510
UG/G- DRY															
CHROMIUM	99584 0	20.5	13.6	18.7	16.8	9.37	15.7	12.7	16.9	14.0	18.3	9.89	13.7	<7.40	11.2
UG/G-DRY															
COPPER	1043 0	14.3	11.5	14.2	12.8	8.17	15.6	12.5	12.8	9.09	14.0	29.1	19.0	30.7	14.9
UG/G- DRY															
LEAD	1052 0	31.9	19.5	33.7	26.3	<17.0	23.6	23.5	30.5	<17.0	28.7	31.5	26.3	<16.0	<16.0
UG/G-DRY															
ZINC	1093 0	59.3	47.2	59.9	47.9	31.7	53.2	46.7	53.2	34.1	54.4	76.7	58.8	60.3	42.5
UG/G-DRY															
ARSENIC	1003 0	<4.70	5.78	7.10	6.68	<4.70	7.39	6.75	<4.70	<4.70	<4.70	<4.70	<5.20	<5.20	<5.20
UG/G- DRY															
MERCURY	71921 0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
UG/G-DRY															
ALDRIN	98356 0	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500	<0.500
UG/G- DRY															
DIELDRIN	98365 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600
UG/G-DRY															
DDT,PP'	98364 0	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00	<2.00
UG/G-DRY															
ENDRIN	98369 0	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00	<4.00
UG/G-DRY.															
CHLORDANE	98361 0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00	<6.00
UG/G- DRY															

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# 5325A	5325B	5326A	5326B	5326C	5327A	5327B	5328A	5328B	5329A	5329B	5330A	5330B	5331A
UNITS	METHOD	30-1 1	30-1 2	30-1 12	30-1 13	30-1 14	30-1 23	30-1 24	30-1 34	30-1 35	30-1 45	30-1 46	30-1 56	30-1 57	30-1 67
DATE		03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/28/86	04/11/86	04/11/86	04/02/86
TIME		08:21	08:21	09:40	09:40	09:40	00:00	00:00	10:40	10:40	10:14	10:14	14:10	14:10	10:37
DDE,PP'	98363	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500
UG/G-DRY	0														
1,4 OXATHIANE	98644	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500
UG/G-DRY	0														
DIMP	98645	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<3.00	<3.00	<3.00
UG/G-DRY	0														
VAPONA	98646	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
UG/G -DRY	0														
HEXACHLOROCYCLOPENT-	98647	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
ADIENE UG/G-DRY	0														
MALATHION	98648	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<2.00	<2.00	<2.00
UG/G-DRY	0														
ISODRIN	98649	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600
UG/G-DRY	0														
1,4 DITHIANE	98650	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<2.00	<2.00	<2.00
UG/G- DRY	0														
DICYCLOPENTADIENE	98651	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<6.00	<6.00	<6.00
UG/G-DRY	0														
DBCP(NEMAGON)	98652	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600
UG/G-DRY	0														
P-CLPHENYLMETHYL-	98653	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
SULFIDE UG/G-DRY	0														
P-CLPHENYLMETHYL-	98654	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.00	<1.00	<1.00
SULFOXIDE UG/G-DRY	0														
ATRAZINE	98655	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.500	<0.500	<0.500
UG/G-DRY	0														
SUPONA	98656	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900	<0.900	<0.900
UG/G-DRY.	0														
DMMP	98657	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<3.00	<3.00	<3.00
UG/G-DRY	0														
PARATHION	98658	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<2.00	<2.00	<2.00
UG/G-DRY	0														
P-CLPHENYLMETHYL-	98703	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400
SULFONE UG/G-DRY	0														
TRANS-1,2-DICHLORO-	98687					<0.300									
ETHENE UG/G-DRY	0														
ETHYLBENZENE	98688					<0.300									
UG/G-DRY	0														
METHYLENE CHLORIDE	98689					<0.300									
UG/G-DRY	0														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# 5325A	5325B	5326A	5326B	5326C	5327A	5327B	5328A	5328B	5329A	5329B	5330A	5330B	5331A
UNITS	METHOD	30-1 1	30-1 2	30-1 12	30-1 13	30-1 14	30-1 23	30-1 24	30-1 34	30-1 35	30-1 45	30-1 46	30-1 56	30-1 57	30-1 67
DATE		03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/28/86	04/11/86	04/11/86	04/02/86
TIME		08:21	08:21	09:40	09:40	09:40	00:00	00:00	10:40	10:40	10:14	10:14	14:10	14:10	10:37
TETRACHLOROETHENE	98690					<0.300									
UG/G-DRY	0														
TOLUENE	98691					<0.300									
UG/G-DRY	0														
1,1,1-TRICHLORO-ETHANE	98692					<0.300									
UG/G-DRY	0														
1,1,2-TRICHLORO-ETHANE	98693					<0.300									
UG/G-DRY	0														
TRICHLOROETHENE	98694					<0.300									
UG/G-DRY	0														
M-XYLENE	98695					<0.300									
UG/G-DRY	0														
MIBK	98696					<0.500									
UG/G-DRY	0														
DMDS	98697					<0.300									
UG/G-DRY	0														
BENZENE	98699					<0.300									
UG/G-DRY	0														
O-AND/OR P-XYLENE	98700					<0.500									
UG/G-DRY	0														
CARBON TETRACHLORIDE	98680					<0.300									
UG/G-DRY	0														
CHLOROBENZENE	98681					<0.300									
UG/G-DRY	0														
CHLOROFORM	98682					<0.300									
UG/G-DRY	0														
1,1-DICHLOROETHANE	98683					<0.300									
UG/G-DRY	0														
1,2-DICHLOROETHANE	98684					<0.300									
UG/G-DRY	0														
BICYCLOHEPTADIENE	98686					<0.300									
UG/G-DRY	0														
DBCP(NEMAGON)	98652	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.60	<0.60	<0.60
UG/G-DRY	Q9														
DBCP	98652	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600
UG/G-DRY	H9														
UNK588	90049	0.649													3.26
UG/G	36														
UNK615	90071						0.455								
UG/G	36														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# 5325A 30-1 1	5325B 30-1 2	5326A 30-1 12	5326B 30-1 13	5326C 30-1 14	5327A 30-1 23	5327B 30-1 24	5328A 30-1 34	5328B 30-1 35	5329A 30-1 45	5329B 30-1 46	5330A 30-1 56	5330B 30-1 57	5331A 30-1 67
DATE			03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/28/86	04/11/86	04/11/86	04/02/86
TIME			08:21	08:21	09:40	09:40	09:40	00:00	00:00	10:40	10:40	10:14	10:14	14:10	14:10	10:37
UNK625		90078	0.813													
	UG/G	36														
UNK626		90079	1.06													
	UG/G	36														
UNK628		90081	0.569											0.838		
	UG/G	36														
UNK631		90083	0.487													
	UG/G	36														
UNK633		90085											0.628			
	UG/G	36														
UNK634		90086	0.377					0.878						0.719	1.12	
	UG/G	36														
UNK636		90088	5.67													
	UG/G	36														
UNK642		90108	0.859					0.641	0.417					0.599		
	UG/G	36														
UNK027		90182					3.02									
	UG/G	36														
UNK566		90200										0.392				
	UG/G	36														
UNK537		90022														
	UG/G	36														
UNK606		90063										0.430				
	UG/G	36														
UNK614		90070					2.33									
	UG/G	36														
UNK609		90066												0.479		
	UG/G	50														
UNK611		90067												0.479		
	UG/G	50														
UNK652		90111												0.719		
	UG/G	50														
UNK617		90072												0.719		
	UG/G	50														
UNK618		90073												0.479		
	UG/G	50														
UNK619		90105												0.479		
	UG/G	50														
UNK637		90089													0.784	
	UG/G	50														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# 5325A 30-1 1	5325B 30-1 2	5326A 30-1 12	5326B 30-1 13	5326C 30-1 14	5327A 30-1 23	5327B 30-1 24	5328A 30-1 34	5328B 30-1 35	5329A 30-1 45	5329B 30-1 46	5330A 30-1 56	5330B 30-1 57	5331A 30-1 67
DATE			03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/27/86	03/27/86	03/28/86	03/28/86	03/28/86	03/28/86	04/11/86	04/11/86	04/02/86
TIME			08:21	08:21	09:40	09:40	09:40	00:00	00:00	10:40	10:40	10:14	10:14	14:10	14:10	10:37
UNK620		90074														
	UG/G	36														
UNK648		90648														
	UG/G	36														
UNK550		90550														
	UG/G	36														
UNK559		90099														
	UG/G	36														
UNK562		90033														
	UG/G	36														
UNK582		90045														
	UG/G	36														
UNK599		90127														
	UG/G	36														
UNK623		90077														
	UG/G	36														
UNK650		90134														
	UG/G	36														
UNK535		90087														
	UG/G	50														
UNK094		90007														
	UG/G	50														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# 5331B	5332A	5332B	5333A	5333B	5333C	5334A	5334B	5334C	5335A	5335B	5335C	5336A	5336B
UNITS	METHOD	30-1 68	30-1 78	30-1 79	30-1 89	30-1 90	30-1 91	30-1 100	30-1 101	30-1 102	30-1 111	30-1 112	30-1 113	30-1 122	30-1 123
DATE		04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	03/27/86	03/27/86	03/27/86	03/26/86	03/26/86	03/26/86	04/02/86	04/02/86
TIME		10:37	10:16	10:16	10:37	10:37	10:37	09:01	09:01	09:01	14:39	14:39	14:39	13:04	13:04
SAMPLE TYPE	71999 0	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE DEPTH FT	99758A 0	4.00	0.0	4.00	0.0	4.00	9.00	0.0	4.00	9.00	0.0	4.00	9.00	0.0	4.00
SITE TYPE 1	99759 0	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
INSTALLATION CODE SAMPLE	99720 0	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK
SAMPLING TECHNIQUE	72005 0	S	S	S	S	S	S	S	S	S	S	S	S	S	S
COORDINATE,N/S STP	98392 0	186362	186301	186301	186372	186372	186372	186969	186969	186969	187192	187192	187192	186975	186975
COORDINATE,E/W STP	98393 0	2192020	2192528	2192528	2193127	2193127	2193127	2192646	2192646	2192646	2193225	2193225	2193225	2192342	2192342
MOISTURE %WET WT	70320 0	7.4	14.7	9.1	8.5	9.5	10.6	12.0	5.2	19.3	11.5	21.0	20.3	10.8	6.3
CADMIUM UG/G- DRY	1028 0	<0.510	<0.510	<0.510	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.510	<0.510
CHROMIUM UG/G-DRY	99584 0	17.2	19.4	15.7	18.1	20.8	17.5	11.9	<7.20	<7.20	15.4	<7.20	<7.20	16.3	9.92
COPPER UG/G- DRY	1043 0	19.5	21.3	18.6	11.6	13.9	11.4	10.7	5.77	35.6	13.1	36.1	36.4	18.0	13.3
LEAD UG/G-DRY	1052 0	<16.0	<16.0	<16.0	32.4	33.7	28.4	<17.0	<17.0	30.1	20.3	32.2	30.6	20.8	<16.0
ZINC UG/G-DRY	1093 0	55.4	66.4	49.9	49.7	60.9	46.8	40.4	25.6	92.6	49.8	82.8	84.4	59.6	36.9
ARSENIC UG/G- DRY	1003 0	<5.20	<5.20	<5.20	<4.70	6.35	5.53	<4.70	<4.70	<4.70	5.90	<4.70	<4.70	<5.20	<5.20
MERCURY UG/G-DRY	71921 0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ALDRIN UG/G- DRY	98356 0	<0.500	<0.500	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500
DIELDRIN UG/G-DRY	98365 0	<0.600	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
DDT,PP' UG/G-DRY	98364 0	<2.00	<2.00	<2.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00
ENDRIN UG/G-DRY.	98369 0	<4.00	<4.00	<4.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00
CHLORDANE UG/G- DRY	98361 0	<6.00	<6.00	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	5331B	5332A	5332B	5333A	5333B	5333C	5334A	5334B	5334C	5335A	5335B	5335C	5336A	5336B
		SAMPLE ID/#													
		30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
UNITS	METHOD	68	78	79	89	90	91	100	101	102	111	112	113	122	123
DATE		04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	03/27/86	03/27/86	03/27/86	03/26/86	03/26/86	03/26/86	04/02/86	04/02/86
TIME		10:37	10:16	10:16	10:37	10:37	10:37	09:01	09:01	09:01	14:39	14:39	14:39	13:04	13:04
DDE,PP'	98363	<0.500	<0.500	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500
UG/G-DRY	0														
1,4 OXATHIANE	98644	<0.500	<0.500	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500
UG/G-DRY	0														
DIMP	98645	<3.00	<3.00	<3.00	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<3.00	<3.00
UG/G-DRY	0														
VAPONA	98646	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
UG/G -DRY	0														
HEXACHLOROCYCLOPENT-	98647	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
ADIENE UG/G-DRY	0														
MALATHION	98648	<2.00	<2.00	<2.00	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<2.00	<2.00
UG/G-DRY	0														
ISODRIN	98649	<0.600	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
UG/G-DRY	0														
1,4 DITHIANE	98650	<2.00	<2.00	<2.00	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<2.00	<2.00
UG/G- DRY	0														
DICYCLOPENTADIENE	98651	<6.00	<6.00	<6.00	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<6.00	<6.00
UG/G-DRY	0														
DBCP(NEMAGON)	98652	<0.600	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
UG/G-DRY	0														
P-CLPHENYLMETHYL-	98653	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
SULFIDE UG/G-DRY	0														
P-CLPHENYLMETHYL-	98654	<1.00	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.00	<1.00
SULFOXIDE UG/G-DRY	0														
ATRAZINE	98655	<0.500	<0.500	<0.500	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.500	<0.500
UG/G-DRY	0														
SUPONA	98656	<0.900	<0.900	<0.900	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900	<0.900
UG/G-DRY.	0														
DMMP	98657	<3.00	<3.00	<3.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<3.00	<3.00
UG/G-DRY	0														
PARATHION	98658	<2.00	<2.00	<2.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<2.00	<2.00
UG/G-DRY	0														
P-CLPHENYLMETHYL-	98703	<0.400	<0.400	<0.400	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400
SULFONE UG/G-DRY	0														
TRANS-1,2-DICHLORO-	98687									<0.300			<0.300		
ETHENE UG/G-DRY	0														
ETHYLBENZENE	98688									<0.300			<0.300		
UG/G-DRY	0														
METHYLENE CHLORIDE	98689									<0.300			<0.300		
UG/G-DRY	0														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# 5331B 30-1 68	5332A 30-1 78	5332B 30-1 79	5333A 30-1 89	5333B 30-1 90	5333C 30-1 91	5334A 30-1 100	5334B 30-1 101	5334C 30-1 102	5335A 30-1 111	5335B 30-1 112	5335C 30-1 113	5336A 30-1 122	5336B 30-1 123
UNITS	METHOD														
DATE		04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	03/27/86	03/27/86	03/27/86	03/26/86	03/26/86	03/26/86	04/02/86	04/02/86
TIME		10:37	10:16	10:16	10:37	10:37	10:37	09:01	09:01	09:01	14:39	14:39	14:39	13:04	13:04
TETRACHLOROETHENE	98690									<0.300			<0.300		
UG/G-DRY	0														
TOLUENE	98691									<0.300			<0.300		
UG/G-DRY	0														
1,1,1-TRICHLORO-ETHANE	98692									<0.300			<0.300		
UG/G-DRY	0														
1,1,2-TRICHLORO-ETHANE	98693									<0.300			<0.300		
UG/G-DRY	0														
TRICHLOROETHENE	98694									<0.300			<0.300		
UG/G-DRY	0														
M-XYLENE	98695									<0.300			<0.300		
UG/G-DRY	0														
MIBK	98696									<0.500			<0.500		
UG/G-DRY	0														
DMDS	98697									<0.300			<0.300		
UG/G-DRY	0														
BENZENE	98699									<0.300			<0.300		
UG/G-DRY	0														
O-AND/OR P-XYLENE	98700									<0.500			<0.500		
UG/G-DRY	0														
CARBON TETRACHLORIDE	98680									<0.300			<0.300		
UG/G-DRY	0														
CHLOROBENZENE	98681									<0.300			<0.300		
UG/G-DRY	0														
CHLOROFORM	98682									<0.300			<0.300		
UG/G-DRY	0														
1,1-DICHLOROETHANE	98683									<0.300			<0.300		
UG/G-DRY	0														
1,2-DICHLOROETHANE	98684									<0.300			<0.300		
UG/G-DRY	0														
BICYCLOHEPTADIENE	98686									<0.300			<0.300		
UG/G-DRY	0														
DBCP(NEMAGON)	98652	<0.60	<0.60	<0.60	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.60	<0.60
UG/G-DRY	Q9														
DBCP	98652	<0.600	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
UG/G-DRY	H9														
UNK588	90049														
UG/G	36														
UNK615	90071										0.377				1.07
UG/G	36														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-ISG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# 5331B 30-1 68	5332A 30-1 78	5332B 30-1 79	5333A 30-1 89	5333B 30-1 90	5333C 30-1 91	5334A 30-1 100	5334B 30-1 101	5334C 30-1 102	5335A 30-1 111	5335B 30-1 112	5335C 30-1 113	5336A 30-1 122	5336B 30-1 123
DATE			04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	03/27/86	03/27/86	03/27/86	03/26/86	03/26/86	03/26/86	04/02/86	04/02/86
TIME			10:37	10:16	10:16	10:37	10:37	10:37	09:01	09:01	09:01	14:39	14:39	14:39	13:04	13:04
UNK625		90078														
	UG/G	36														
UNK626		90079														
	UG/G	36														
UNK628		90081														
	UG/G	36														
UNK631		90083														
	UG/G	36														
UNK633		90085														
	UG/G	36														
UNK634		90086	0.540	0.938	0.660	0.389			0.405						0.336	0.640
	UG/G	36														
UNK636		90088														
	UG/G	36														
UNK642		90108				0.346			0.353			0.536				
	UG/G	36														
UNK027		90182														
	UG/G	36														
UNK566		90200														
	UG/G	36														
UNK537		90022														
	UG/G	36														
UNK606		90063														
	UG/G	36														
UNK614		90070						2.04				5.85	7.24	2.50		
	UG/G	36														
UNK609		90066														
	UG/G	50														
UNK611		90067														
	UG/G	50														
UNK652		90111														
	UG/G	50														
UNK617		90072														
	UG/G	50														
UNK618		90073														
	UG/G	50														
UNK619		90105														
	UG/G	50														
UNK637		90089														
	UG/G	50														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# 5331B 30-1 68	5332A 30-1 78	5332B 30-1 79	5333A 30-1 89	5333B 30-1 90	5333C 30-1 91	5334A 30-1 100	5334B 30-1 101	5334C 30-1 102	5335A 30-1 111	5335B 30-1 112	5335C 30-1 113	5336A 30-1 122	5336B 30-1 123
DATE			04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	04/02/86	03/27/86	03/27/86	03/27/86	03/26/86	03/26/86	03/26/86	04/02/86	04/02/86
TIME			10:37	10:16	10:16	10:37	10:37	10:37	09:01	09:01	09:01	14:39	14:39	14:39	13:04	13:04
UNK620		90074				0.391										
	UG/G	36														
UNK648		90648														
	UG/G	36														
UNK550		90550												0.482		
	UG/G	36														
UNK559		90099														
	UG/G	36														
UNK562		90033														
	UG/G	36														
UNK582		90045										0.414	0.533			
	UG/G	36														
UNK599		90127										0.355				
	UG/G	36														
UNK623		90077											0.549			
	UG/G	36														
UNK650		90134										0.468				
	UG/G	36														
UNK635		90087														
	UG/G	50														
UNK094		90007														
	UG/G	50														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET #	METHOD	SAMPLE ID/# 5337A 30-1 133	5337B 30-1 134	5338A 30-1 144	5338B 30-1 145	5339A 30-1 155	5339B 30-1 156	5340A 30-1 166	5340B 30-1 167	5341A 30-1 177	5341B 30-1 178	5341C 30-1 179	5342A 30-1 188	5342B 30-1 189	5343A 30-1 199
DATE				04/11/86	04/11/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	03/26/86
TIME				13:47	13:47	13:22	13:22	13:22	13:22	12:45	12:45	08:50	08:50	08:50	08:50	08:50	12:33
SAMPLE TYPE		71999	0	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE DEPTH	FT	99758A	0	0.0	4.00	0.0	4.00	0.0	4.00	0.0	4.00	0.0	4.00	9.00	0.0	4.00	0.0
SITE TYPE 1		99759	0	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
INSTALLATION CODE	SAMPLE	99720	0	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK
SAMPLING TECHNIQUE		72005	0	S	S	S	S	S	S	S	S	S	S	S	S	S	S
COORDINATE,N/S	STP	98392	0	186948	186948	187339	187339	187726	187726	188199	188199	188669	188669	188199	187683	187683	188047
COORDINATE,E/W	STP	98393	0	2191848	2191848	2193593	2193593	2193605	2193605	2193628	2193628	2193638	2193638	2193628	2192981	2192981	2193106
MOISTURE	%WET WT	70320	0	8.9	6.6	9.0	11.0	9.8	9.1	11.8	7.0	16.9	21.1	20.7	20.2	9.3	10.9
CADMIUM	UG/G- DRY	1028	0	<0.510	<0.510	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.510	<0.510	<0.510	<0.510	<0.510	<0.900
CHROMIUM	UG/G-DRY	99584	0	<7.40	13.7	15.3	<7.20	18.1	16.4	17.7	16.2	21.1	11.9	12.6	19.0	9.40	15.9
COPPER	UG/G- DRY	1043	0	9.40	13.2	14.0	14.6	15.3	14.9	13.6	14.4	23.6	50.8	57.5	21.0	12.3	20.3
LEAD	UG/G-DRY	1052	0	<16.0	<16.0	25.9	29.1	30.2	27.6	32.2	28.3	<16.0	<16.0	26.3	<16.0	<16.0	26.3
ZINC	UG/G-DRY	1093	0	<28.0	48.3	52.3	88.4	58.4	56.0	56.1	55.6	68.9	111	88.8	66.1	41.5	50.2
ARSENIC	UG/G- DRY	1003	0	<5.20	<5.20	5.82	<4.70	<4.70	<4.70	<4.70	6.34	<5.20	<5.20	<5.20	<5.20	<5.20	5.87
MERCURY	UG/G-DRY	71921	0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ALDRIN	UG/G- DRY	98356	0	<0.500	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900
DIELDRIN	UG/G-DRY	98365	0	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.300
DDT,PP'	UG/G-DRY	98364	0	<2.00	<2.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00	<2.00	<2.00	<2.00	<0.400
ENDRIN	UG/G-DRY.	98369	0	<4.00	<4.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00	<4.00	<4.00	<4.00	<0.700
CHLORDANE	UG/G- DRY	98361	0	<6.00	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00	<6.00	<6.00	<6.00	<1.00

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# 5337A	5337B	5338A	5338B	5339A	5339B	5340A	5340B	5341A	5341B	5341C	5342A	5342B	5343A
UNITS	METHOD	30-1 133	30-1 134	30-1 144	30-1 145	30-1 155	30-1 156	30-1 166	30-1 167	30-1 177	30-1 178	30-1 179	30-1 188	30-1 189	30-1 199
DATE		04/11/86	04/11/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	03/26/86
TIME		13:47	13:47	13:22	13:22	13:22	13:22	12:45	12:45	08:50	08:50	08:50	08:50	08:50	12:33
DDE,PP'	98363	<0.500	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500	<0.300
UG/G-DRY	0														
1,4 OXATHIANE	98644	<0.500	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500	<0.300
UG/G-DRY	0														
DIMP	98645	<3.00	<3.00	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<3.00	<3.00	<3.00	<3.00	<3.00	<0.500
UG/G-DRY	0														
VAPONA	98646	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
UG/G -DRY	0														
HEXACHLOROCYCLOPENT-	98647	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
ADIENE UG/G-DRY	0														
MALATHION	98648	<2.00	<2.00	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<2.00	<2.00	<2.00	<2.00	<2.00	<0.600
UG/G-DRY	0														
ISODRIN	98649	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.300
UG/G-DRY	0														
1,4 DITHIANE	98650	<2.00	<2.00	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<2.00	<2.00	<2.00	<2.00	<2.00	<0.300
UG/G- DRY	0														
DICYCLOPENTADIENE	98651	<6.00	<6.00	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<6.00	<6.00	<6.00	<6.00	<6.00	<0.300
UG/G-DRY	0														
DBCP(NEMAGON)	98652	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.300
UG/G-DRY	0														
P-CLPHENYLMETHYL-	98653	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
SULFIDE UG/G-DRY	0														
P-CLPHENYLMETHYL-	98654	<1.00	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.00	<1.00	<1.00	<1.00	<1.00	<0.400
SULFOXIDE UG/G-DRY	0														
ATRAZINE	98655	<0.500	<0.500	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.500	<0.500	<0.500	<0.500	<0.500	<0.700
UG/G-DRY	0														
SUPONA	98656	<0.900	<0.900	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500
UG/G-DRY.	0														
DMMP	98657	<3.00	<3.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<3.00	<3.00	<3.00	<3.00	<3.00	<2.00
UG/G-DRY	0														
PARATHION	98658	<2.00	<2.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<2.00	<2.00	<2.00	<2.00	<2.00	<0.700
UG/G-DRY	0														
P-CLPHENYLMETHYL-	98703	<0.400	<0.400	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400	<0.300
SULFONE UG/G-DRY	0														
TRANS-1,2-DICHLORO-	98687														
ETHENE UG/G-DRY	0														
ETHYLBENZENE	98688														
UG/G-DRY	0														
METHYLENE CHLORIDE	98689														
UG/G-DRY	0														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# 5337A	5337B	5338A	5338B	5339A	5339B	5340A	5340B	5341A	5341B	5341C	5342A	5342B	5343A
UNITS	METHOD	30-1 133	30-1 134	30-1 144	30-1 145	30-1 155	30-1 156	30-1 166	30-1 167	30-1 177	30-1 178	30-1 179	30-1 188	30-1 189	30-1 199
DATE		04/11/86	04/11/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	03/26/86
TIME		13:47	13:47	13:22	13:22	13:22	13:22	12:45	12:45	08:50	08:50	08:50	08:50	08:50	12:33
TETRACHLOROETHENE	98690														
UG/G-DRY	0														
TOLUENE	98691														
UG/G-DRY	0														
1,1,1-TRICHLORO-	98692														
ETHANE UG/G-DRY	0														
1,1,2-TRICHLORO-	98693														
ETHANE UG/G-DRY	0														
TRICHLOROETHENE	98694														
UG/G-DRY	0														
M-XYLENE	98695														
UG/G-DRY	0														
MIBK	98696														
UG/G-DRY	0														
DMDS	98697														
UG/G-DRY	0														
BENZENE	98699														
UG/G-DRY	0														
O-AND/OR P-XYLENE	98700														
UG/G-DRY	0														
CARBON TETRACHLORIDE	98680														
UG/G-DRY	0														
CHLOROBENZENE	98681														
UG/G-DRY	0														
CHLOROFORM	98682														
UG/G-DRY	0														
1,1-DICHLOROETHANE	98683														
UG/G-DRY	0														
1,2-DICHLOROETHANE	98684														
UG/G-DRY	0														
BICYCLOHEPTADIENE	98686														
UG/G-DRY	0														
DBCP(NEMAGON)	98652	<0.60	<0.60	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.60	<0.60	<0.60	<0.60	<0.60	<0.30
UG/G-DRY	Q9														
DBCP	98652	<0.600	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.300
UG/G-DRY	H9														
UNK588	90049														
UG/G	36														
UNK615	90071			0.604		0.567					2.53	1.26			
UG/G	36														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-ISG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# 5337A 30-1 133	5337B 30-1 134	5338A 30-1 144	5338B 30-1 145	5339A 30-1 155	5339B 30-1 156	5340A 30-1 166	5340B 30-1 167	5341A 30-1 177	5341B 30-1 178	5341C 30-1 179	5342A 30-1 188	5342B 30-1 189	5343A 30-1 199
DATE			04/11/86	04/11/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	03/26/86
TIME			13:47	13:47	13:22	13:22	13:22	13:22	12:45	12:45	08:50	08:50	08:50	08:50	08:50	12:33
UNK625		90078														
	UG/G	36														
UNK626		90079														
	UG/G	36														
UNK628		90081														
	UG/G	36														
UNK631		90083														
	UG/G	36														
UNK633		90085														
	UG/G	36														
UNK634		90086	1.10		0.476		0.459		0.464					0.877	0.882	
	UG/G	36														
UNK636		90088														
	UG/G	36														
UNK642		90108			0.648		0.561	0.370		0.566						0.811
	UG/G	36														
UNK027		90182														
	UG/G	36														
UNK566		90200					0.664									
	UG/G	36														
UNK537		90022														
	UG/G	36														
UNK606		90063														
	UG/G	36														
UNK614		90070			3.87	2.37	4.62	3.70	2.36	2.31						
	UG/G	36														
UNK609		90066														
	UG/G	50														
UNK611		90067														
	UG/G	50														
UNK652		90111														
	UG/G	50														
UNK617		90072														
	UG/G	50														
UNK618		90073														
	UG/G	50														
UNK619		90105														
	UG/G	50														
UNK637		90089														
	UG/G	50														

ENVIRONMENTAL SCIENCE & ENGINEERING 02/17/87 STATUS: PAGE# 15

PROJECT NUMBER 65937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# 5337A 30-1 133	5337B 30-1 134	5338A 30-1 144	5338B 30-1 145	5339A 30-1 155	5339B 30-1 156	5340A 30-1 166	5340B 30-1 167	5341A 30-1 177	5341B 30-1 178	5341C 30-1 179	5342A 30-1 188	5342B 30-1 189	5343A 30-1 199
DATE			04/11/86	04/11/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	03/26/86
TIME			13:47	13:47	13:22	13:22	13:22	13:22	12:45	12:45	08:50	08:50	08:50	08:50	08:50	12:33
UNK620	UG/G	90074 36														
UNK648	UG/G	90648 36														
UNK550	UG/G	90550 36					0.444									
UNK559	UG/G	90099 36			0.380		0.551									
UNK562	UG/G	90033 36			0.755		0.914									
UNK582	UG/G	90045 36														
UNK599	UG/G	90127 36														
UNK623	UG/G	90077 36														0.383
UNK650	UG/G	90134 36														
UNK635	UG/G	90087 50														
UNK094	UG/G	90007 50														

ENVIRONMENTAL SCIENCE & ENGINEERING 02/17/87 STATUS: PAGE# 16

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# 5343B 30-1 200	5344A 30-1 210	5344B 30-1 211	5345A 30-1 221	5345B 30-1 222	5345C 30-1 223	5346A 30-1 232	5346B 30-1 233	5347A 30-1 243	5347B 30-1 244	5348A 30-1 254	5348B 30-1 255	5348C 30-1 256	5349A 30-1 265
DATE			03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	04/11/86	04/11/86	04/11/86	04/02/86	04/02/86	03/26/86	03/26/86	03/26/86	04/02/86
TIME			12:33	09:21	09:21	09:40	09:40	09:40	13:00	13:00	14:12	14:12	10:04	10:04	10:04	15:03
SAMPLE TYPE		71999 0	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE DEPTH	FT	99758A 0	4.00	0.0	4.00	0.0	4.00	9.00	0.0	4.00	0.0	4.00	0.0	4.00	9.00	0.0
SITE TYPE 1		99759 0	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
INSTALLATION CODE		99720 0	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK
SAMPLING TECHNIQUE	SAMPLE	72005 0	S	S	S	S	S	S	S	S	S	S	S	S	S	S
COORDINATE,N/S	STP	98392 0	188047	188510	188510	187416	187416	187416	187463	187463	187347	187347	187900	187900	187900	187945
COORDINATE,E/W	STP	98393 0	2193106	2193204	2193204	2192604	2192604	2192604	2191921	2191921	2191255	2191255	2192638	2192638	2192638	2191924
MOISTURE	%WET WT	70320 0	7.7	10.0	7.8	16.8	9.7	14.3	12.6	7.5	5.8	11.0	12.1	14.2	4.6	10.0
CADMIUM	UG/G- DRY	1028 0	<0.900	<0.510	<0.510	<0.510	<0.510	<0.510	<0.510	<0.510	<0.510	<0.510	<0.510	<0.510	<0.510	<0.510
CHROMIUM	UG/G-DRY	99584 0	8.09	19.6	19.4	16.5	<7.40	<7.40	10.5	10.1	9.65	15.9	16.6	11.3	9.40	15.1
COPPER	UG/G- DRY	1043 0	6.97	18.7	19.6	20.1	38.6	26.5	13.6	11.8	13.8	18.8	17.0	13.3	6.34	17.5
LEAD	UG/G-DRY	1052 0	<17.0	31.3	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	<16.0	28.9	21.0	<16.0	<16.0
ZINC	UG/G-DRY	1093 0	33.4	68.1	53.6	50.3	91.7	65.0	34.8	41.9	33.4	57.6	57.9	42.2	74.4	58.7
ARSENIC	UG/G- DRY	1003 0	<4.70	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20	<5.20
MERCURY	UG/G-DRY	71921 0	<0.050	<0.050	0.066	<0.050	<0.050	0.082	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ALDRIN	UG/G- DRY	98356 0	<0.900	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
DIELDRIN	UG/G-DRY	98365 0	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
DDT,PP'	UG/G-DRY	98364 0	<0.400	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
ENDRIN	UG/G-DRY.	98369 0	<0.700	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00
CHLORDANE	UG/G- DRY	98361 0	<1.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# 5343B 30-1 200	5344A 30-1 210	5344B 30-1 211	5345A 30-1 221	5345B 30-1 222	5345C 30-1 223	5346A 30-1 232	5346B 30-1 233	5347A 30-1 243	5347B 30-1 244	5348A 30-1 254	5348B 30-1 255	5348C 30-1 256	5349A 30-1 265
UNITS	METHOD														
DATE		03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	04/11/86	04/11/86	04/11/86	04/02/86	04/02/86	03/26/86	03/26/86	03/26/86	04/02/86
TIME		12:33	09:21	09:21	09:40	09:40	09:40	13:00	13:00	14:12	14:12	10:04	10:04	10:04	15:03
DDE,PP'	98363	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
UG/G-DRY	0														
1,4 OXATHIANE	98644	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
UG/G-DRY	0														
DIMP	98645	<0.500	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
UG/G-DRY	0														
VAPONA	98646	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
UG/G -DRY	0														
HEXACHLOROCYCLOPENT-	98647	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
ADIENE UG/G-DRY	0														
MALATHION	98648	<0.600	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
UG/G-DRY	0														
ISODRIN	98649	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
UG/G-DRY	0														
1,4 DITHIANE	98650	<0.300	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
UG/G- DRY	0														
DICYCLOPENTADIENE	98651	<0.300	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00	<6.00
UG/G-DRY	0														
DBCP(NEMAGON)	98652	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
UG/G-DRY	0														
P-CLPHENYLMETHYL-	98653	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
SULFIDE UG/G-DRY	0														
P-CLPHENYLMETHYL-	98654	<0.400	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
SULFOXIDE UG/G-DRY	0														
ATRAZINE	98655	<0.700	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
UG/G-DRY	0														
SUPONA	98656	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900
UG/G-DRY.	0														
DMMP	98657	<2.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
UG/G-DRY	0														
PARATHION	98658	<0.700	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
UG/G-DRY	0														
P-CLPHENYLMETHYL-	98703	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400
SULFONE UG/G-DRY	0														
TRANS-1,2-DICHLORO-	98687						<0.800							<0.800	
ETHENE UG/G-DRY	0														
ETHYLBENZENE	98688						<0.400							<0.400	
UG/G-DRY	0														
METHYLENE CHLORIDE	98689						NA							NA	
UG/G-DRY	0														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# 5343B 30-1 200	5344A 30-1 210	5344B 30-1 211	5345A 30-1 221	5345B 30-1 222	5345C 30-1 223	5346A 30-1 232	5346B 30-1 233	5347A 30-1 243	5347B 30-1 244	5348A 30-1 254	5348B 30-1 255	5348C 30-1 256	5349A 30-1 265
UNITS	METHOD														
DATE		03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	04/11/86	04/11/86	04/11/86	04/02/86	04/02/86	03/26/86	03/26/86	03/26/86	04/02/86
TIME		12:33	09:21	09:21	09:40	09:40	09:40	13:00	13:00	14:12	14:12	10:04	10:04	10:04	15:03
TETRACHLOROETHENE	98690						<0.500							<0.500	
UG/G-DRY	0														
TOLUENE	98691						<0.300							<0.300	
UG/G-DRY	0														
1,1,1-TRICHLORO-ETHANE	98692						<0.500							<0.500	
UG/G-DRY	0														
1,1,2-TRICHLORO-ETHANE	98693						<0.600							<0.600	
UG/G-DRY	0														
TRICHLOROETHENE	98694						<0.600							<0.600	
UG/G-DRY	0														
M-XYLENE	98695						<0.300							<0.300	
UG/G-DRY	0														
MIBK	98696						<0.400							<0.400	
UG/G-DRY	0														
DMDS	98697						<4.00							<4.00	
UG/G-DRY	0														
BENZENE	98699						<1.00							<1.00	
UG/G-DRY	0														
O-AND/OR P-XYLENE	98700						<0.500							<0.500	
UG/G-DRY	0														
CARBON TETRACHLORIDE	98680						<0.400							<0.400	
UG/G-DRY	0														
CHLOROBENZENE	98681						<0.300							<0.300	
UG/G-DRY	0														
CHLOROFORM	98682						<0.700							<0.700	
UG/G-DRY	0														
1,1-DICHLOROETHANE	98683						<0.500							<0.500	
UG/G-DRY	0														
1,2-DICHLOROETHANE	98684						<0.400							<0.400	
UG/G-DRY	0														
BICYCLOHEPTADIENE	98686						<0.800							<0.800	
UG/G-DRY	0														
DBCP(NEMAGON)	98652	<0.30	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
UG/G-DRY	Q9														
DBCP	98652	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600
UG/G-DRY	H9														
UNK588	90049														
UG/G	36														
UNK615	90071								0.432					1.05	
UG/G	36														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # / METHOD	SAMPLE ID/# 5343B 30-1 200	5344A 30-1 210	5344B 30-1 211	5345A 30-1 221	5345B 30-1 222	5345C 30-1 223	5346A 30-1 232	5346B 30-1 233	5347A 30-1 243	5347B 30-1 244	5348A 30-1 254	5348B 30-1 255	5348C 30-1 256	5349A 30-1 265
DATE			03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	04/11/86	04/11/86	04/11/86	04/02/86	04/02/86	03/26/86	03/26/86	03/26/86	04/02/86
TIME			12:33	09:21	09:21	09:40	09:40	09:40	13:00	13:00	14:12	14:12	10:04	10:04	10:04	15:03
UNK625		90078														
	UG/G	36														
UNK626		90079														
	UG/G	36														
UNK628		90081														
	UG/G	36														
UNK631		90083														
	UG/G	36														
UNK633		90085	0.917													
	UG/G	36														
UNK634		90086					0.664	1.17				0.674				
	UG/G	36														
UNK636		90088														
	UG/G	36														
UNK642		90108														
	UG/G	36														
UNK027		90182														
	UG/G	36														
UNK566		90200														
	UG/G	36														
UNK537		90022														
	UG/G	36														
UNK606		90063														
	UG/G	36														
UNK614		90070	6.14													
	UG/G	36														
UNK609		90066														
	UG/G	50														
UNK611		90067														
	UG/G	50														
UNK652		90111														
	UG/G	50														
UNK617		90072														
	UG/G	50														
UNK618		90073														
	UG/G	50														
UNK619		90105														
	UG/G	50														
UNK637		90089														
	UG/G	50														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# 5343B 30-1 200	5344A 30-1 210	5344B 30-1 211	5345A 30-1 221	5345B 30-1 222	5345C 30-1 223	5346A 30-1 232	5346B 30-1 233	5347A 30-1 243	5347B 30-1 244	5348A 30-1 254	5348B 30-1 255	5348C 30-1 256	5349A 30-1 265
DATE			03/26/86	03/26/86	03/26/86	04/11/86	04/11/86	04/11/86	04/11/86	04/11/86	04/02/86	04/02/86	03/26/86	03/26/86	03/26/86	04/02/86
TIME			12:33	09:21	09:21	09:40	09:40	09:40	13:00	13:00	14:12	14:12	10:04	10:04	10:04	15:03
UNK620		90074														
	UG/G	36														
UNK648		90648														
	UG/G	36														
UNK550		90550														
	UG/G	36														
UNK559		90099														
	UG/G	36														
UNK562		90033														
	UG/G	36														
UNK582		90045		0.889												
	UG/G	36														
UNK599		90127														
	UG/G	36														
UNK623		90077														
	UG/G	36														
UNK650		90134														
	UG/G	36														
UNK635		90087														
	UG/G	50									0.850					1.000
UNK094		90007														
	UG/G	50													0.157	

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# 5349B	5350A	5350B	5350C	5351A	5351B	5352A	5352B	5353A	5353B
		30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1	30-1
UNITS	METHOD	266	276	277	278	287	288	298	299	309	310
DATE		04/02/86	03/28/86	03/28/86	03/28/86	03/27/86	03/27/86	04/02/86	04/02/86	04/11/86	04/11/86
TIME		15:03	08:44	08:44	08:44	00:00	00:00	14:40	14:40	13:21	13:21
SAMPLE TYPE	71999 0	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE DEPTH	99758A 0	4.00	0.0	4.00	9.00	0.0	4.00	0.0	4.00	0.0	4.00
FT											
SITE TYPE 1	99759 0	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE	BORE
INSTALLATION CODE	99720 0	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK
SAMPLE											
SAMPLING TECHNIQUE	72005 0	S	S	S	S	S	S	S	S	S	S
COORDINATE,N/S	98392 0	187945	187787	187787	187787	188565	188565	188498	188498	188408	188408
STP											
COORDINATE,E/W	98393 0	2191924	2191048	2191048	2191048	2192707	2192707	2191966	2191966	2191327	2191327
STP											
MOISTURE	70320	8.4	10.1	6.1	4.6	4.7	19.4	9.5	7.8	17.6	9.3
%WET WT	0										
CADMIUM	1028	<0.510	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.510	<0.510
UG/G- DRY	0										
CHROMIUM	99584	14.1	21.5	14.3	10.6	14.5	11.1	21.4	24.9	17.1	10.7
UG/G-DRY	0										
COPPER	1043	18.0	13.2	10.1	7.84	9.35	8.65	13.3	13.6	17.3	13.1
UG/G- DRY	0										
LEAD	1052	20.5	33.1	21.0	<17.0	24.0	20.1	41.4	36.3	<16.0	<16.0
UG/G-DRY	0										
ZINC	1093	49.6	60.6	43.5	31.5	43.8	45.2	63.8	63.9	44.2	42.9
UG/G-DRY	0										
ARSENIC	1003	<5.20	6.47	<4.70	<4.70	<4.70	<4.70	5.91	6.24	<5.20	<5.20
UG/G- DRY	0										
MERCURY	71921	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
UG/G-DRY	0										
ALDRIN	98356	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500
UG/G- DRY	0										
DIELDRIN	98365	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
UG/G-DRY	0										
DDT,PP'	98364	<2.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00
UG/G-DRY	0										
ENDRIN	98369	<4.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00
UG/G-DRY.	0										
CHLORDANE	98361	<6.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00
UG/G- DRY	0										

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# 5349B 30-1 266	5350A 30-1 276	5350B 30-1 277	5350C 30-1 278	5351A 30-1 287	5351B 30-1 288	5352A 30-1 298	5352B 30-1 299	5353A 30-1 309	5353B 30-1 310
DATE			04/02/86	03/28/86	03/28/86	03/28/86	03/27/86	03/27/86	04/02/86	04/02/86	04/11/86	04/11/86
TIME			15:03	08:44	08:44	08:44	00:00	00:00	14:40	14:40	13:21	13:21
DDE,PP'	UG/G-DRY	98363 0	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500
1,4 OXATHIANE	UG/G-DRY	98644 0	<0.500	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500
DIMP	UG/G-DRY	98645 0	<3.00	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<3.00	<3.00
VAPONA	UG/G -DRY	98646 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
HEXACHLOROCYCLOPENT-ADIENE	UG/G-DRY	98647 0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MALATHION	UG/G-DRY	98648 0	<2.00	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<2.00	<2.00
ISODRIN	UG/G-DRY	98649 0	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
1,4 DITHIANE	UG/G- DRY	98650 0	<2.00	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<2.00	<2.00
DICYCLOPENTADIENE	UG/G-DRY	98651 0	<6.00	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<6.00	<6.00
DBCP(NEMAGON)	UG/G-DRY	98652 0	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
P-CLPHENYLMETHYL-SULFIDE	UG/G-DRY	98653 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
P-CLPHENYLMETHYL-SULFOXIDE	UG/G-DRY	98654 0	<1.00	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.00	<1.00
ATRAZINE	UG/G-DRY	98655 0	<0.500	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.500	<0.500
SUPONA	UG/G-DRY.	98656 0	<0.900	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900	<0.900
DMMP	UG/G-DRY	98657 0	<3.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<3.00	<3.00
PARATHION	UG/G-DRY	98658 0	<2.00	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<2.00	<2.00
P-CLPHENYLMETHYL-SULFONE	UG/G-DRY	98703 0	<0.400	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400
TRANS-1,2-DICHLORO-ETHENE	UG/G-DRY	98687 0										
ETHYLBENZENE	UG/G-DRY	98688 0										
METHYLENE CHLORIDE	UG/G-DRY	98689 0										

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# 5349B	5350A	5350B	5350C	5351A	5351B	5352A	5352B	5353A	5353B
UNITS	METHOD	30-1 266	30-1 276	30-1 277	30-1 278	30-1 287	30-1 288	30-1 298	30-1 299	30-1 309	30-1 310
DATE		04/02/86	03/28/86	03/28/86	03/28/86	03/27/86	03/27/86	04/02/86	04/02/86	04/11/86	04/11/86
TIME		15:03	08:44	08:44	08:44	00:00	00:00	14:40	14:40	13:21	13:21
TETRACHLOROETHENE	98690										
UG/G-DRY	0										
TOLUENE	98691										
UG/G-DRY	0										
1,1,1-TRICHLORO-ETHANE	98692										
UG/G-DRY	0										
1,1,2-TRICHLORO-ETHANE	98693										
UG/G-DRY	0										
TRICHLOROETHENE	98694										
UG/G-DRY	0										
M-XYLENE	98695										
UG/G-DRY	0										
MIBK	98696										
UG/G-DRY	0										
DMDS	98697										
UG/G-DRY	0										
BENZENE	98699										
UG/G-DRY	0										
O-AND/OR P-XYLENE	98700										
UG/G-DRY	0										
CARBON TETRACHLORIDE	98680										
UG/G-DRY	0										
CHLOROBENZENE	98681										
UG/G-DRY	0										
CHLOROFORM	98682										
UG/G-DRY	0										
1,1-DICHLOROETHANE	98683										
UG/G-DRY	0										
1,2-DICHLOROETHANE	98684										
UG/G-DRY	0										
BICYCLOHEPTADIENE	98686										
UG/G-DRY	0										
DBCP(NEMAGON)	98652	<0.60	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.60	<0.60
UG/G-DRY	Q9										
DBCP	98652	<0.600	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600
UG/G-DRY	H9										
UNK588	90049										
UG/G	36										
UNK615	90071										
UG/G	36										

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# 5349B 30-1 266	5350A 30-1 276	5350B 30-1 277	5350C 30-1 278	5351A 30-1 287	5351B 30-1 288	5352A 30-1 298	5352B 30-1 299	5353A 30-1 309	5353B 30-1 310
DATE			04/02/86	03/28/86	03/28/86	03/28/86	03/27/86	03/27/86	04/02/86	04/02/86	04/11/86	04/11/86
TIME			15:03	08:44	08:44	08:44	00:00	00:00	14:40	14:40	13:21	13:21
UNK625		90078										
	UG/G	36										
UNK626		90079										
	UG/G	36										
UNK628		90081										
	UG/G	36										
UNK631		90083										
	UG/G	36										
UNK633		90085						0.445				
	UG/G	36										
UNK634		90086										1.10
	UG/G	36										
UNK636		90088										
	UG/G	36										
UNK642		90108							0.350			
	UG/G	36										
UNK027		90182										
	UG/G	36										
UNK566		90200										
	UG/G	36										
UNK537		90022										
	UG/G	36										
UNK606		90063										
	UG/G	36										
UNK614		90070				0.382						
	UG/G	36										
UNK609		90066										
	UG/G	50										
UNK611		90067										
	UG/G	50										
UNK652		90111										
	UG/G	50										
UNK617		90072										
	UG/G	50										
UNK618		90073										
	UG/G	50										
UNK619		90105										
	UG/G	50										
UNK637		90089										
	UG/G	50										

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP 30-1 PROJECT MANAGER M. WITT
30-1SG LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# 5349B 30-1 266	5350A 30-1 276	5350B 30-1 277	5350C 30-1 278	5351A 30-1 287	5351B 30-1 288	5352A 30-1 298	5352B 30-1 299	5353A 30-1 309	5353B 30-1 310
DATE			04/02/86	03/28/86	03/28/86	03/28/86	03/27/86	03/27/86	04/02/86	04/02/86	04/11/86	04/11/86
TIME			15:03	08:44	08:44	08:44	00:00	00:00	14:40	14:40	13:21	13:21
UNK620		90074										
	UG/G	36										
UNK648		90648								0.360		
	UG/G	36										
UNK550		90550										
	UG/G	36										
UNK559		90099										
	UG/G	36										
UNK562		90033										
	UG/G	36										
UNK582		90045										
	UG/G	36										
UNK599		90127										
	UG/G	36										
UNK623		90077										
	UG/G	36										
UNK650		90134										
	UG/G	36										
UNK635		90087										
	UG/G	50										
UNK094		90007										
	UG/G	50										

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.1MB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# BLK T14QC 3	BLK T14QC 5	BLK T14QC 6	BLK T14QC 7	BLK T14QC 8	BLK T14QC 10	BLK T14QC 11	BLK T14QC 12	BLK T14QC 13	BLANK T14QC 52	BLANK T14QC 53	BLANK T14QC 54	BLANK T14QC 56	BLK T14QC 63
UNITS	METHOD														
DATE		02/28/86	03/05/86	03/06/86	03/06/86	03/13/86	03/14/86	03/14/86	04/01/86	04/07/86	05/12/86	05/12/86	05/12/86	05/12/86	07/11/86
TIME									00:00	00:00					00:00
SAMPLE TYPE	71999 0	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
SAMPLE DEPTH	99758A 0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FT															
SITE TYPE 1	99759 0	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB	QCMB
INSTALLATION CODE	99720 0	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK	RK
SAMPLE															
SAMPLING TECHNIQUE	72005 0	G	G	G	G	G	G	G	G	G	G	G	G	G	G
MOISTURE	70320 0	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	0.01	0.01	0.01	0.01	0.01
%WET WT															
CADMIUM	1028 0	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.510	<0.510	<0.510	<0.510	
UG/G- DRY															
CHROMIUM	99584 0	11.6	14.8	14.2	15.2	11.2	12.8	12.7	11.2	10.7	14.5	10.4	8.50	<7.40	
UG/G-DRY															
COPPER	1043 0	9.70	9.50	10.00	10.6	9.45	9.58	10.4	9.22	9.00	16.2	11.4	10.3	8.90	
UG/G- DRY															
LEAD	1052 0	<17.0	24.1	<17.0	22.9	<17.0	<17.0	<17.0	<17.0	<17.0	<16.0	<16.0	<16.0	<16.0	
UG/G-DRY															
ZINC	1093 0	43.3	48.9	47.2	51.4	43.0	47.4	44.7	43.3	39.8	42.1	36.8	34.0	33.4	
UG/G-DRY															
ARSENIC	1003 0	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<4.70	<5.20	<5.20	<5.20	<5.20	
UG/G- DRY															
MERCURY	71921 0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.070	<0.070	<0.070	<0.070	NA
UG/G-DRY															
ALDRIN	98356 0	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.900	<0.500	<0.500	<0.500	<0.500	<0.500
UG/G- DRY															
DIELDRIN	98365 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600
UG/G-DRY															
DDT,PP'	98364 0	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<2.00	<2.00	<2.00	<2.00	<2.00
UG/G-DRY															
ENDRIN	98369 0	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<4.00	<4.00	<4.00	<4.00	<4.00
UG/G-DRY.															
CHLORDANE	98361 0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<6.00	<6.00	<6.00	<6:00	<6.00
UG/G- DRY															
DDE,PP'	98363 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500
UG/G-DRY															
1,4 OXATHIANE	98644 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500
UG/G-DRY															

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.1MB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # / METHOD	SAMPLE ID/# BLK T14QC 3	BLK T14QC 5	BLK T14QC 6	BLK T14QC 7	BLK T14QC 8	BLK T14QC 10	BLK T14QC 11	BLK T14QC 12	BLK T14QC 13	BLANK T14QC 52	BLANK T14QC 53	BLANK T14QC 54	BLANK T14QC 56	BLK T14QC 63
DATE			02/28/86	03/05/86	03/06/86	03/06/86	03/13/86	03/14/86	03/14/86	04/01/86	04/07/86	05/12/86	05/12/86	05/12/86	05/12/86	07/11/86
TIME										00:00	00:00					00:00
DIMP	UG/G-DRY	98645 0	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<3.00	<3.00	<3.00	<3.00	<3.00
VAPONA	UG/G -DRY	98646 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
HEXACHLOROCYCLOPENTADIENE	UG/G-DRY	98647 0	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
MALATHION	UG/G-DRY	98648 0	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<0.600	<2.00	<2.00	<2.00	<2.00	<2.00
ISODRIN	UG/G-DRY	98649 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600
1,4 DITHIANE	UG/G- DRY	98650 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<2.00	<2.00	<2.00	<2.00	<2.00
DICYCLOPENTADIENE	UG/G-DRY	98651 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<6.00	<6.00	<6.00	<6.00	<6.00
DBCP(NEMAGON)	UG/G-DRY	98652 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600
P-CLPHENYLMETHYL-SULFIDE	UG/G-DRY	98653 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
P-CLPHENYLMETHYL-SULFOXIDE	UG/G-DRY	98654 0	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400	<1.00	<1.00	<1.00	<1.00	<1.00
ATRAZINE	UG/G-DRY	98655 0	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.500	<0.500	<0.500	<0.500	<0.500
SUPONA	UG/G-DRY.	98656 0	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.900	<0.900	<0.900	<0.900	<0.900
DMMP	UG/G-DRY	98657 0	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<3.00	<3.00	<3.00	<3.00	<3.00
PARATHION	UG/G-DRY	98658 0	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<0.700	<2.00	<2.00	<2.00	<2.00	<2.00
P-CLPHENYLMETHYL-SULFONE	UG/G-DRY	98703 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400
COORDINATE,N/S	STP	98392 0														
COORDINATE,E/W	STP	98393 0														
TRANS-1,2-DICHLOROETHENE	UG/G-DRY	98687 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.800	<0.800	<0.800	<0.800	<0.800
ETHYLBENZENE	UG/G-DRY	98688 0	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400
METHYLENE CHLORIDE	UG/G-DRY	98689 0	3.63	3.61	3.69	3.64	2.38	1.43	0.938	1.05	0.900	NA	NA	NA	NA	NA

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.IMB LAB COORDINATOR PAUL GEISZLER

PARAMETERS / UNITS	STORET # / METHOD	SAMPLE ID/# BLK T14QC 3	BLK T14QC 5	BLK T14QC 6	BLK T14QC 7	BLK T14QC 8	BLK T14QC 10	BLK T14QC 11	BLK T14QC 12	BLK T14QC 13	BLANK T14QC 52	BLANK T14QC 53	BLANK T14QC 54	BLANK T14QC 56	BLK T14QC 63
DATE		02/28/86	03/05/86	03/06/86	03/06/86	03/13/86	03/14/86	03/14/86	04/01/86	04/07/86	05/12/86	05/12/86	05/12/86	05/12/86	07/11/86
TIME									00:00	00:00					00:00
TETRACHLOROETHENE	98690	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500
UG/G-DRY	0														
TOLUENE	98691	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
UG/G-DRY	0														
1,1,1-TRICHLORO-ETHANE	98692	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500
UG/G-DRY	0														
1,1,2-TRICHLORO-ETHANE	98693	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600
UG/G-DRY	0														
TRICHLOROETHENE	98694	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.600	<0.600	<0.600	<0.600	<0.600
UG/G-DRY	0														
M-XYLENE	98695	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	0.360	<0.300	<0.300
UG/G-DRY	0														
MIBK	98696	<0.500	<0.500	<0.500	<0.500	<0.500	1.20	<0.500	<0.500	<0.500	<0.400	<0.400	<0.400	<0.400	<0.400
UG/G-DRY	0														
DMDS	98697	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<4.00	<4.00	<4.00	<4.00	<4.00
UG/G-DRY	0														
BENZENE	98699	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<1.00	<1.00	<1.00	<1.00	<1.00
UG/G-DRY	0														
O-AND/OR P-XYLENE	98700	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
UG/G-DRY	0														
CARBON TETRACHLORIDE	98680	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400
UG/G-DRY	0														
CHLOROBENZENE	98681	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300
UG/G-DRY	0														
CHLOROFORM	98682	0.748	0.946	1.10	0.989	0.615	<0.300	<0.300	<0.300	<0.300	<0.700	<0.700	<0.700	<0.700	<0.700
UG/G-DRY	0														
1,1-DICHLOROETHANE	98683	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.500	<0.500	<0.500	<0.500	<0.500
UG/G-DRY	0														
1,2-DICHLOROETHANE	98684	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.400	<0.400	<0.400	<0.400	<0.400
UG/G-DRY	0														
BICYCLOHEPTADIENE	98686	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.800	<0.800	<0.800	<0.800	<0.800
UG/G-DRY	0														
UNK525	90016	0.951													
UG/G	36														
UNK529	90018	0.572													
UG/G	36														
UNK534	90114	0.839													
UG/G	36														
UNK538	90123														
UG/G	36														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.IMB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# BLK T14QC 3	BLK T14QC 5	BLK T14QC 6	BLK T14QC 7	BLK T14QC 8	BLK T14QC 10	BLK T14QC 11	BLK T14QC 12	BLK T14QC 13	BLANK T14QC 52	BLANK T14QC 53	BLANK T14QC 54	BLANK T14QC 56	BLK T14QC 63
DATE			02/28/86	03/05/86	03/06/86	03/06/86	03/13/86	03/14/86	03/14/86	04/01/86	04/07/86	05/12/86	05/12/86	05/12/86	05/12/86	07/11/86
TIME										00:00	00:00					00:00
UNK540		90198	18.3		13.0											
	UG/G	36														
UNK542		90024	20.0													
	UG/G	36														
UNK545		90027	1.19													
	UG/G	36														
UNK550		90550														
	UG/G	36														
UNK551		90095														
	UG/G	36														
UNK558		90098	0.360													
	UG/G	36														
UNK562		90033														
	UG/G	36														
UNK566		90200	0.966													
	UG/G	36														
UNK582		90045														
	UG/G	36														
UNK586		90047	0.423													
	UG/G	36														
UNK588		90049	25.7		20.1											
	UG/G	36														
UNK603		90060														
	UG/G	36														
UNK604		90061														
	UG/G	36														
UNK608		90065														
	UG/G	36														
UNK609		90066														
	UG/G	36														
UNK613		90069														
	UG/G	36														
UNK614		90070	7.62													
	UG/G	36														
UNK615		90071														
	UG/G	36														
UNK617		90072														
	UG/G	36														
UNK619		90105														
	UG/G	36														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.1MB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# BLK T14QC 3	BLK T14QC 5	BLK T14QC 6	BLK T14QC 7	BLK T14QC 8	BLK T14QC 10	BLK T14QC 11	BLK T14QC 12	BLK T14QC 13	BLANK T14QC 52	BLANK T14QC 53	BLANK T14QC 54	BLANK T14QC 56	BLK T14QC 63
DATE			02/28/86	03/05/86	03/06/86	03/06/86	03/13/86	03/14/86	03/14/86	04/01/86	04/07/86	05/12/86	05/12/86	05/12/86	05/12/86	07/11/86
TIME										00:00	00:00					00:00
UNK620		90074			1.38											
	UG/G	36														
UNK622		90076														
	UG/G	36														
UNK623		90077														
	UG/G	36														
UNK627		90080														
	UG/G	36														
UNK635		90087														
	UG/G	36														
UNK638		90090			0.375											
	UG/G	36														
UNK641		90107														
	UG/G	36														
UNK643		90133	12.3		11.6											
	UG/G	36														
UNK650		90134			0.520											
	UG/G	36														
UNK110		90181														
	UG/G	0														
UNK133		90176														
	UG/G	0														
UNK524		90015														
	UG/G	36														
UNK528		90132														
	UG/G	36														
UNK541		90023			14.7											
	UG/G	36														
UNK544		90026			0.859											
	UG/G	36														
UNK556		90152														
	UG/G	36														
UNK559		90099														
	UG/G	36														
UNK560		90126														
	UG/G	36														
UNK567		90036														
	UG/G	36														
UNK568		90037														
	UG/G	36														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.1MB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# BLK T14QC 3	BLK T14QC 5	BLK T14QC 6	BLK T14QC 7	BLK T14QC 8	BLK T14QC 10	BLK T14QC 11	BLK T14QC 12	BLK T14QC 13	BLANK T14QC 52	BLANK T14QC 53	BLANK T14QC 54	BLANK T14QC 56	BLK T14QC 63
DATE			02/28/86	03/05/86	03/06/86	03/06/86	03/13/86	03/14/86	03/14/86	04/01/86	04/07/86	05/12/86	05/12/86	05/12/86	05/12/86	07/11/86
TIME										00:00	00:00					00:00
UNK569		90038														
	UG/G	36														
UNK573		90100														
	UG/G	36														
UNK575		90121														
	UG/G	36														
UNK576		90040														
	UG/G	36														
UNK577		90041														
	UG/G	36														
UNK578		90042														
	UG/G	36														
UNK579		90043														
	UG/G	36														
UNK580		90044														
	UG/G	36														
UNK583		90046														
	UG/G	36														
UNK584		90115														
	UG/G	36														
UNK585		90102														
	UG/G	36														
UNK587		90048														
	UG/G	36														
UNK591		90051														
	UG/G	36														
UNK592		90103														
	UG/G	36														
UNK593		90052														
	UG/G	36														
UNK594		90053														
	UG/G	36														
UNK595		90054														
	UG/G	36														
UNK598		90056														
	UG/G	36														
UNK600		90057			8.63											
	UG/G	36														
UNK601		90058														
	UG/G	36														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.1MB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# BLK T14QC 3	BLK T14QC 5	BLK T14QC 6	BLK T14QC 7	BLK T14QC 8	BLK T14QC 10	BLK T14QC 11	BLK T14QC 12	BLK T14QC 13	BLANK T14QC 52	BLANK T14QC 53	BLANK T14QC 54	BLANK T14QC 56	BLK T14QC 63
DATE			02/28/86	03/05/86	03/06/86	03/06/86	03/13/86	03/14/86	03/14/86	04/01/86	04/07/86	05/12/86	05/12/86	05/12/86	05/12/86	07/11/86
TIME										00:00	00:00					00:00
UNK606		90063														
	UG/G	36														
UNK611		90067														
	UG/G	36														
UNK612		90068														
	UG/G	36														
UNK616		90104														
	UG/G	36														
UNK618		90073														
	UG/G	36														
UNK621		90075														
	UG/G	36														
UNK624		90118														
	UG/G	36														
UNK625		90078														
	UG/G	36														
UNK628		90081														
	UG/G	36														
UNK629		90082			1.02											
	UG/G	36														
UNK633		90085			0.390											
	UG/G	36														
UNK634		90086														
	UG/G	36														
UNK636		90088														
	UG/G	36														
UNK640		90199														
	UG/G	36														
UNK642		90108			0.502											
	UG/G	36														
UNK646		90192														
	UG/G	36														
UNK648		90648														
	UG/G	36														
UNK649		90117														
	UG/G	36														
UNK652		90111														
	UG/G	36														
UNK653		90112														
	UG/G	36														

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.1MB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	STORET #	SAMPLE ID/# BLK T14QC 3	BLK T14QC 5	BLK T14QC 6	BLK T14QC 7	BLK T14QC 8	BLK T14QC 10	BLK T14QC 11	BLK T14QC 12	BLK T14QC 13	BLANK T14QC 52	BLANK T14QC 53	BLANK T14QC 54	BLANK T14QC 56	BLK T14QC 63
UNITS	METHOD														
DATE		02/28/86	03/05/86	03/06/86	03/06/86	03/13/86	03/14/86	03/14/86	04/01/86	04/07/86	05/12/86	05/12/86	05/12/86	05/12/86	07/11/86
TIME									00:00	00:00					00:00
UNK664	90154														
UG/G	36														

PROJECT NUMBER 85937 0420
FIELD GROUP T14QC
30.1MB

PROJECT NAME RMA TASK14
PROJECT MANAGER M. WITT
LAB COORDINATOR PAUL GEISZLER

PARAMETERS / UNITS	STORET # / METHOD	SAMPLE ID/# BLK T14QC 66	BLK T14QC 68	BLK T14QC 69	BLK T14QC 81	BLK OPSED 80
DATE		07/11/86	07/11/86	07/11/86	05/04/86	04/02/86
TIME		00:00	00:00	00:00	00:00	00:00
SAMPLE TYPE	71999 0	SO	SO	SO	SO	SE
SAMPLE DEPTH FT	99758A 0	0.0	0.0	0.0	0.0	0.0
SITE TYPE I	99759 0	QCMB	QCMB	QCMB	QCMB	QCMB
INSTALLATION CODE	99720 0	RK	RK	RK	RK	RK
SAMPLE SAMPLING TECHNIQUE	72005 0	G	G	G	G	G
MOISTURE %WET WT	70320 0	0.01	0.01	0.01	2.4	2.4
CADMIUM UG/G- DRY	1028 0					NA
CHROMIUM UG/G-DRY	99584 0					NA
COPPER UG/G- DRY	1043 0					NA
LEAD UG/G-DRY	1052 0					NA
ZINC UG/G-DRY	1093 0					NA
ARSENIC UG/G- DRY	1003 0					NA
MERCURY UG/G-DRY	71921 0	NA	NA	NA	NA	<0.050
ALDRIN UG/G- DRY	98356 0	<0.500	<0.500	<0.500	<0.500	<0.900
DIELDRIN UG/G-DRY	98365 0	<0.600	<0.600	<0.600	<0.600	<0.300
DDT,PP' UG/G-DRY	98364 0	<2.00	<2.00	<2.00	<2.00	<0.400
ENDRIN UG/G-DRY.	98369 0	<4.00	<4.00	<4.00	<4.00	<0.700
CHLORDANE UG/G- DRY	98361 0	<6.00	<6.00	<6.00	<6.00	<1.00
DDE,PP' UG/G-DRY	98363 0	<0.500	<0.500	<0.500	<0.500	<0.300
1,4 OXATHIANE UG/G-DRY	98644 0	<0.500	<0.500	<0.500	<0.500	<0.300

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.1MB LAB COORDINATOR PAUL GEISZLER

PARAMETERS	UNITS	STORET # METHOD	SAMPLE ID/# BLK T14QC 66	BLK T14QC 68	BLK T14QC 69	BLK T14QC 81	BLK OPSED 80
DATE			07/11/86	07/11/86	07/11/86	05/04/86	04/02/86
TIME			00:00	00:00	00:00	00:00	00:00
DIMP	UG/G-DRY	98645 0	<3.00	<3.00	<3.00	<3.00	<0.500
VAPONA	UG/G -DRY	98646 0	<0.300	<0.300	<0.300	<0.300	<0.300
HEXACHLOROCYCLOPENT-ADIENE	UG/G-DRY	98647 0	<1.00	<1.00	<1.00	<1.00	<1.00
MALATHION	UG/G-DRY	98648 0	<2.00	<2.00	<2.00	<2.00	<0.600
ISODRIN	UG/G-DRY	98649 0	<0.600	<0.600	<0.600	<0.600	<0.300
1,4 DITHIANE	UG/G- DRY	98650 0	<2.00	<2.00	<2.00	<2.00	<0.300
DICYCLOPENTADIENE	UG/G-DRY	98651 0	<6.00	<6.00	<6.00	<6.00	<0.300
DBCP(NEMAGON)	UG/G-DRY	98652 0	<0.600	<0.600	<0.600	<0.600	<0.300
P-CLPHENYLMETHYL-SULFIDE	UG/G-DRY	98653 0	<0.300	<0.300	<0.300	<0.300	<0.300
P-CLPHENYLMETHYL-SULFOXIDE	UG/G-DRY	98654 0	<1.00	<1.00	<1.00	<1.00	<0.400
ATRAZINE	UG/G-DRY	98655 0	<0.500	<0.500	<0.500	<0.500	<0.700
SUPONA	UG/G-DRY.	98656 0	<0.900	<0.900	<0.900	<0.900	<0.500
DMMP	UG/G-DRY	98657 0	<3.00	<3.00	<3.00	<3.00	<2.00
PARATHION	UG/G-DRY	98658 0	<2.00	<2.00	<2.00	<2.00	<0.700
P-CLPHENYLMETHYL-SULFONE	UG/G-DRY	98703 0	<0.400	<0.400	<0.400	<0.400	<0.300
COORDINATE,N/S	STP	98392 0					
COORDINATE,E/W	STP	98393 0					
TRANS-1,2-DICHLORO-ETHENE	UG/G-DRY	98687 0	<0.800				<0.300
ETHYLBENZENE	UG/G-DRY	98688 0	<0.400				<0.300
METHYLENE CHLORIDE	UG/G-DRY	98689 0	NA				4.92

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.1MB LAB COORDINATOR PAUL GEISZLER

SAMPLE ID/#

PARAMETERS	STORET #	BLK T14QC 66	BLK T14QC 68	BLK T14QC 69	BLK T14QC 81	BLK OPSED 80
UNITS	METHOD					
DATE		07/11/86	07/11/86	07/11/86	05/04/86	04/02/86
TIME		00:00	00:00	00:00	00:00	00:00
TETRACHLOROETHENE	98690	<0.500				<0.300
UG/G-DRY	0					
TOLUENE	98691	<0.300				<0.300
UG/G-DRY	0					
1,1,1-TRICHLORO-	98692	<0.500				<0.300
ETHANE UG/G-DRY	0					
1,1,2-TRICHLORO-	98693	<0.600				<0.300
ETHANE UG/G-DRY	0					
TRICHLOROETHENE	98694	<0.600				<0.300
UG/G-DRY	0					
M-XYLENE	98695	<0.300				<0.300
UG/G-DRY	0					
MIBK	98696	<0.400				<0.500
UG/G-DRY	0					
DMDS	98697	<4.00				<0.300
UG/G-DRY	0					
BENZENE	98699	<1.00				<0.300
UG/G-DRY	0					
O-AND/OR P-XYLENE	98700	<0.500				<0.500
UG/G-DRY	0					
CARBON TETRACHLORIDE	98680	<0.400				<0.300
UG/G-DRY	0					
CHLOROBENZENE	98681	<0.300				<0.300
UG/G-DRY	0					
CHLOROFORM	98682	<0.700				0.717
UG/G-DRY	0					
1,1-DICHLOROETHANE	98683	<0.500				<0.300
UG/G-DRY	0					
1,2-DICHLOROETHANE	98684	<0.400				<0.300
UG/G-DRY	0					
BICYCLOHEPTADIENE	98686	<0.800				<0.300
UG/G-DRY	0					
UNK525	90016					
UG/G	36					
UNK529	90018					
UG/G	36					
UNK534	90114					
UG/G	36					
UNK538	90123					
UG/G	36					

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.IMB LAB COORDINATOR PAUL GEISZLER

SAMPLE ID/#

PARAMETERS	UNITS	STORET # METHOD	BLK T14QC 66	BLK T14QC 68	BLK T14QC 69	BLK T14QC 81	BLK OPSED 80
DATE			07/11/86	07/11/86	07/11/86	05/04/86	04/02/86
TIME			00:00	00:00	00:00	00:00	00:00
UNK540		90198					
	UG/G	36					
UNK542		90024					
	UG/G	36					
UNK545		90027					
	UG/G	36					
UNK550		90550					
	UG/G	36					
UNK551		90095					
	UG/G	36					
UNK558		90098					
	UG/G	36					
UNK562		90033					
	UG/G	36					
UNK566		90200					
	UG/G	36					
UNK582		90045					
	UG/G	36					
UNK586		90047					
	UG/G	36					
UNK588		90049					
	UG/G	36					
UNK603		90060					
	UG/G	36					
UNK604		90061					
	UG/G	36					
UNK608		90065					
	UG/G	36					
UNK609		90066					
	UG/G	36					
UNK613		90069					
	UG/G	36					
UNK614		90070					
	UG/G	36					
UNK615		90071					
	UG/G	36					
UNK617		90072					
	UG/G	36					
UNK619		90105					
	UG/G	36					

PROJECT NUMBER 85937 0420 PROJECT NAME RMA TASK14
FIELD GROUP T14QC PROJECT MANAGER M. WITT
30.IMB LAB COORDINATOR PAUL GEISZLER

SAMPLE ID/#

PARAMETERS	UNITS	STORET # METHOD	BLK T14QC 66	BLK T14QC 68	BLK T14QC 69	BLK T14QC 81	BLK OPSED 80
DATE			07/11/86	07/11/86	07/11/86	05/04/86	04/02/86
TIME			00:00	00:00	00:00	00:00	00:00
UNK620		90074					
	UG/G	36					
UNK622		90076					
	UG/G	36					
UNK623		90077					
	UG/G	36					
UNK627		90080					
	UG/G	36					
UNK635		90087					
	UG/G	36					
UNK638		90090					
	UG/G	36					
UNK641		90107					
	UG/G	36					
UNK643		90133					
	UG/G	36					
UNK650		90134					
	UG/G	36					
UNK110		90181					
	UG/G	0					
UNK133		90176					
	UG/G	0					
UNK524		90015					
	UG/G	36					
UNK528		90132					
	UG/G	36					
UNK541		90023					
	UG/G	36					
UNK544		90026					
	UG/G	36					
UNK556		90152					
	UG/G	36					
UNK559		90099					
	UG/G	36					
UNK560		90126					
	UG/G	36					
UNK567		90036					
	UG/G	36					
UNK568		90037					
	UG/G	36					

PROJECT NUMBER 85937 0420
FIELD GROUP T14QC
30.1MB

PROJECT NAME RMA TASK14
PROJECT MANAGER M. WITT
LAB COORDINATOR PAUL GEISZLER

SAMPLE ID/#

PARAMETERS	UNITS	STORET # METHOD	BLK T14QC 66	BLK T14QC 68	BLK T14QC 69	BLK T14QC 81	BLK OPSED 80
DATE			07/11/86	07/11/86	07/11/86	05/04/86	04/02/86
TIME			00:00	00:00	00:00	00:00	00:00
UNK569		90038					
	UG/G	36					
UNK573		90100					
	UG/G	36					
UNK575		90121					
	UG/G	36					
UNK576		90040					
	UG/G	36					
UNK577		90041					
	UG/G	36					
UNK578		90042					
	UG/G	36					
UNK579		90043					
	UG/G	36					
UNK580		90044					
	UG/G	36					
UNK583		90046					
	UG/G	36					
UNK584		90115					
	UG/G	36					
UNK585		90102					
	UG/G	36					
UNK587		90048					
	UG/G	36					
UNK591		90051					
	UG/G	36					
UNK592		90103					
	UG/G	36					
UNK593		90052					
	UG/G	36					
UNK594		90053					
	UG/G	36					
UNK595		90054					
	UG/G	36					
UNK598		90056					
	UG/G	36					
UNK600		90057					
	UG/G	36					
UNK601		90058					
	UG/G	36					

PROJECT NUMBER 85937 0420
FIELD GROUP T14QC
30.1MB

PROJECT NAME RMA TASK14
PROJECT MANAGER M. WITT
LAB COORDINATOR PAUL GEISZLER

SAMPLE ID/#

PARAMETERS	UNITS	STORET # METHOD	BLK T14QC 66	BLK T14QC 68	BLK T14QC 69	BLK T14QC 81	BLK OPSED 80
DATE			07/11/86	07/11/86	07/11/86	05/04/86	04/02/86
TIME			00:00	00:00	00:00	00:00	00:00
UNK606		90063					
	UG/G	36					
UNK611		90067					
	UG/G	36					
UNK612		90068					
	UG/G	36					
UNK616		90104					
	UG/G	36					
UNK618		90073					
	UG/G	36					
UNK621		90075					
	UG/G	36					
UNK624		90118					
	UG/G	36					
UNK625		90078					
	UG/G	36					
UNK628		90081					
	UG/G	36					
UNK629		90082					
	UG/G	36					
UNK633		90085					
	UG/G	36					
UNK634		90086					
	UG/G	36					
UNK636		90088					
	UG/G	36					
UNK640		90199					
	UG/G	36					
UNK642		90108					
	UG/G	36					
UNK646		90192					
	UG/G	36					
UNK648		90648					
	UG/G	36					
UNK649		90117					
	UG/G	36					
UNK652		90111					
	UG/G	36					
UNK653		90112					
	UG/G	36					

PROJECT NUMBER 85937 0420
FIELD GROUP T14QC
30.1MB

PROJECT NAME RMA TASK14
PROJECT MANAGER M. WITT
LAB COORDINATOR PAUL GEISZLER

SAMPLE ID/#

PARAMETERS	UNITS	STORET # / METHOD	BLK T14QC 66	BLK T14QC 68	BLK T14QC 69	BLK T14QC 81	BLK OPSED 80
DATE			07/11/86	07/11/86	07/11/86	05/04/86	04/02/86
TIME			00:00	00:00	00:00	00:00	00:00
UNK664	UG/G	90154 / 36					

STATE OF COLORADO

COLORADO DEPARTMENT OF HEALTH

4210 East 11th Avenue
Denver, Colorado 80220
Phone (303) 320-8333

Roy Romer
Governor

Thomas M. Vernon, M.D.
Executive Director

October 22, 1987

Mr. Donald Campbell
Program Manager's Office
RMA Contamination Cleanup
Department of the Army
Aberdeen Proving Grounds
Maryland 21010-5401

Dear Mr. Campbell:

Enclosed are the state's comments on Task 2, 7, 12, 14 and 15 Draft Phase I Contamination Assessment Reports (CARs) for the following sites:

Task 2

Site 1-3 Mounded Material

Task 7

Site 3-1/3-3 Drainage Ditch and Overall Basin
Site 24-7 North Bog

Task 12

Site 12-1 Buried Lake Sludge

Task 14

Site 4-5 Disposal Trenches
Site 30-1 Impact Area
Site 30-5 M-34 Demilitarization Area

Task 15

Site 4-2 Burning Pit

Our principle concerns with the reports are that the representation of the extent of contamination in the CAR is severely underestimated, and that the implementation of the remaining Phase I plans as proposed and the proposed Phase II programs will not adequately define the nature and extent of contamination. The plans should be modified to fully define the nature and extent of soil contamination in these sites, and to be consistent with the requirements of the National Contingency Plan for the conduct of remedial investigations.

871170-1/10

The state's comments are subject to change pending the review of the recently obtained 1986 third and fourth quarter GC/MS ground water data.

If you have any questions on the enclosed comments, please contact Jeff Edson.

Sincerely,

David C. Shelton
Director
Hazardous Materials and
Waste Management Division

DCS:nr

cc: Dave Strang, RMA
Ken Conright, Tri-County Health Dept.
Beth Gallegos
Larry Ford, SACWSD
Howard Kenison, Attorney General's Office
Robert Duprey, U.S. EPA
Chris Hahn, Shell Oil Company
Thomas Bick, U.S. Department of Justice
Major Scott Isaacson, Department of the Army
Edward McGrath, Holme, Robert & Owen

**RESPONSE TO PRECEEDING GENERAL COMMENT
OF THE STATE OF COLORADO ON THE
TASK 14 DRAFT FINAL REPORT
SITE 30-1: IMPACT AREAS**

Response:

The objectives of the Phase I programs as performed and the Phase II programs as planned have been previously presented and explained in the various Technical Plans, the Introduction to the CARs, and successive CAR review meetings. Based on the collective results of the investigative techniques outlined in these references, the nature and extent of contamination have been assessed using the most conclusive data available and best professional judgement. All available historical information, aerial photograph interpretations, geophysical surveys, and chemical analysis results have been used to define the vertical and lateral extent of contamination. Phase I and Phase II boring placements and chemical analyses are intended to provide the most effective procedures of collecting meaningful data on which to base estimates of contamination. The technical plans and investigative techniques for this soil contamination assessment have been presented for comment to EPA, and investigations have been modified, where needed, in accordance with EPA requirements. In addition, all Remedial Investigations (RI) have implemented technical programs consistent with the National Contingency Plan, and CERCLA guidelines for the conduct of RI at hazardous waste sites.

We feel that the RI programs being conducted will adequately define the nature and extent of contamination at RMA and provide meaningful data upon which a Feasibility Study (FS) and future remedial actions can be based. In the event that data gaps still exist at the completion of the Phase II program, further investigative techniques will be pursued to fill such gaps.

In all cases, based on the data presented, the most conservative estimate of contamination has been developed. A revised estimate will be provided at the conclusion of the Phase II program which will more accurately define the extent of contamination at any given site. All estimates are, of course, dependent on final settlement of preliminary pollutant limit values (PPLV) for contaminants at RMA.

**RESPONSE TO GENERAL COMMENTS OF
OCTOBER 22, 1987 FROM
COLORADO DEPARTMENT OF HEALTH
PERTAINING TO ALL PHASE I
CONTAMINATION ASSESSMENT REPORTS (CARS)**

Comment 1: Potential action levels for organic and inorganic analytes in the soils may be lower than detection limits used in the Phase I program. Contingencies must be made to re-investigate all sites if action levels warrant lower detection limits.

Response: The Phase I soil investigations utilized certified analytical methods that were developed to minimize the detection limit while allowing the Army to analyze for a wide range of pertinent analytes in a large number of samples. Specific Phase II analytical methods are then utilized to further define the extent of contamination suggested by the Phase I analysis. Phase II methods use specific compound detection devices to reduce the detection limit of any particular compound to the lowest level which is technically achievable, while maintaining a degree of confidence in results which is legally defensible.

Because of the complexity in defining action levels and the lengthy review required to establish tentative levels, this specific issue was placed under consideration by the "How Clean is Clean" committee. Rather than delay the RI 3 to 4 years in order to further define and substantiate the action levels, the program was allowed to proceed, but with some recognized risk. As previously stated to all MOA parties, further remedial investigations may be required to address the final action levels.

Comment 2: There are numerous, reoccurring, non-target analytes found in many sites. A formal process must be presented to determine whether non-target analytes belong on target analyte lists. Furthermore, target analytes may need to be determined on a source by source (or section by section basis), rather than on an "Arsenal-wide" basis. Revised target analytes programs should be implemented in the Phase II program.

Response: The Phase II target analyte list for each site investigated is based on available Phase I results, including target and nontarget detections. MOA parties, including representatives from the Colorado Department of Health (CDH), review these data and the nontarget

results regularly to determine that significant nontarget compounds are being adequately addressed in Phase II. Comments received from MOA that are specific in nature are carefully considered by the Army. In each site investigation, the Army reviews nontarget data and MOA comments in order to ascertain the necessity of further defining the extent of a Phase I nontarget compound. In addition, a committee comprised of RI and FS team members is systematically evaluating all nontarget compounds detected during the RI program.

Although this technical review process is subjective, serious candidates for inclusion on the target list have included: those compounds which occur frequently or in a pattern; compounds of high concentrations; high toxicity compounds; carcinogenic compounds; and compounds that may be considered as byproducts or degradation products of target compounds. Compounds such as benzothiazole and several Army agent degradation products were added to the Phase II target list as a result of this review process. In each case, the Army has provided ample opportunity to every party to formally document any serious concern regarding the Phase II target analyte program.

Comment 3: For sites where contaminants have been detected in the unsaturated zone at the water table, the Phase II program must sample the saturated zone. These borings will determine the vertical extent of source-related contaminants and provide insight into potential groundwater contamination.

Response: The intent of the Phase I soil investigations as described in the various technical plans submitted to the MOA parties was to identify and quantify contamination in the unsaturated zone. Therefore, sampling was restricted to intervals at or above the water table. In addition to the soil program, the Army has conducted an extensive program of surface and ground water monitoring at RMA. Soils information will be evaluated in conjunction with information gathered during the various water analytical programs that have been conducted. Evaluation of soil contamination with respect to surface and ground water monitoring results will be presented in the Study Area Reports to be issued to MOA parties. In some instances, the Phase II program will sample intervals at or below the water table at locations within each site suspected of contributing to aquifer contamination. Contaminant concentrations in these soil samples, if detected, will also be compared against local ground water quality data.

Comment 4:

The Army has labeled many non-target analytes found in the soils as a laboratory induced contamination. Little, if any, information is presented to support this determination. Many of these contaminants have been found in concentrations too high to be indicative of laboratory contamination (e.g., methylene chloride 800 ppm, Site 4-5). Further, many laboratory batches that exhibit "laboratory contamination" have clean laboratory blanks.

If laboratory induced contamination overwhelms the GC/MS screen, the chemical analysis program becomes suspect and must be re-evaluated. Further, a procedure for documenting the identification and verification of suspected laboratory contaminants must be presented.

Response:

A position paper concerning contaminants which are listed as "laboratory induced" is currently in preparation and will be released to MOA parties upon completion.

RESPONSES TO SPECIFIC COMMENTS OF THE COLORADO DEPARTMENT OF HEALTH ON THE DRAFT FINAL TASK 14 REPORT SITE 30-1: IMPACT AREAS (VERSION 2.2)

Comment_1: p.7

The statement that the 10 ppb endrin value was not substantiated in the Task 4 ISP contradicts the findings in the ISP report which indicates an endrin concentration of 10 ppb in monitoring Well 30005.

Response

The statement concerning the 10 ppb endrin value in Well 30004 from the RMA database has been corrected to a 10 ppb endrin value in Well 30005 in the Task 4 ISP Report.

Comment_2: is not p. 14

Figure 30-1-6 indicates that the Old Sanitary Landfill included as part of the Site 30-4 Landfill, but is part of Site 30-1. However, the Army did not investigate the Old Sanitary Landfill area pursuant to the Site 30-1 Phase I Technical Plan. Similarly, the Task 7 - Site 30-4 CAR did not include the Old Sanitary Landfill area in its investigation. A program must be initiated to define the nature and extent of any contamination in this area.

Response

The 1984 RMACCPMT map (RIC#84034R01) was the basis of all Phase I soil investigations, and Site 30-4 (Sanitary Landfill) boundaries. During the Site 30-1 geophysical investigation, intense magnetic and EM inphase response indicated the location of the Old Sanitary Landfill. The nature and extent of contamination in the Old Sanitary Landfill as well as the locations of the six soil borings in this area are presented in the Site 30-4 CAR (Task 7).

Shell Oil Company

c/o Holme Roberts & Owen
Suite 1800
1700 Broadway
Denver, CO 80290

June 24, 1987

USATHAMA
Office of the Program Manager
Rocky Mountain Arsenal Contamination Cleanup
ATTN: AMXRM-EE: Chief: Mr. Donald L. Campbell
Bldg E4585, Trailer
Aberdeen Proving Ground, MD 21010-5401

Dear Mr. Campbell:

Enclosed herewith are Shell Oil's comments on the Draft Final Contamination Assessment Reports for sites 19-UNC, 22-UNC, 27-UNC, and 30-1 assessed under Task 14.

Very truly yours,

C. K. Hahn

C. K. Hahn
Manager
Denver Site Project

RDL:ajg

Enclosure

cc: (w/enclosure)
USATHAMA
Office of the Program Manager
Rocky Mountain Arsenal Contamination Cleanup
ATTN: AMXRM-EE: Mr. Kevin T. Blose
Bldg E4585, Trailer
Aberdeen Proving Ground, MD 21010-5401

USATHAMA
Office of the Program Manager
Rocky Mountain Arsenal Contamination Cleanup
ATTN: PMSO: Mr. Brian L. Anderson
Aberdeen Proving Ground, MD 21010-5401

87502-1/2

cc: Mr. Thomas Bick
Environmental Enforcement Section
Land & Natural Resources Division
U.S. Department of Justice
P.O. Box 23896
Benjamin Franklin Station
Washington, D.C. 20026

Mr. Scott Isaacson
Headquarters - Department of the Army
ATTN: DAJA-LTS
Washington, D.C. 20310-2210

Ms. Patricia Bohm
Office of Attorney General
CERCLA Litigation Section
1560 Broadway, Suite 250
Denver, CO 80202

Mr. Chris Sutton
Colorado Department of Health
4210 East 11th Avenue
Denver, CO 80220

Mr. Robert L. Duprey
Director, Air & Waste Management Division
U.S. Environmental Protection Agency, Region VIII
One Denver Place
999 18th Street, Suite 1300
Denver, CO 80202-2413

Mr. Connally Mears
U.S. Environmental Protection Agency, Region VIII
One Denver Place
999 18th Street, Suite 1300
Denver, CO 80202-2413

Mr. Thomas P. Looby
Assistant Director
Colorado Department of Health
4210 East 11th Avenue
Denver, CO 80220

RESPONSES TO SPECIFIC COMMENTS OF THE SHELL OIL COMPANY ON THE DRAFT FINAL TASK 14 REPORT SITE 30-1: IMPACT AREAS (VERSION 2.2)

Comment 1:
Page iv, 9
first paragraph

Two firing stations for the Site 30-1 mortar impact area are shown on RMA Drawings D-748, 4.2 inch Mortar Range, June 4, 1948 and AG-7, Area Map, Observation Post-Bldg 853, Mortar Range, 4-26-45. One station (map D-748) is located alongside "C" Street in Section 26. The concrete firing emplacements are clearly visible at this station today. A "short range firing house" is shown on Drawing AG-7 located along the eastern boundary of Section 30 directly west of Site 30-1.

The legend on Drawing AG-7 indicates that Site 30-1 may also have been used for testing incendiary (M69X) bombs. A "test stand" is shown which is located 300 ft northeast of the Observation Post Building 853.

Response

Drawings D-748 and AG-7 have been reviewed and evaluated for additional information relevant to the Site 30-1 investigation. The observation past locations have been included in Section 2.0. The "Short Range Mortar Firing House" is on the western boundary of Section 30 directly west of Site 30-1. Mortar fire is shown to follow a due east trajectory and would impact approximately 750 ft north of the Observation Post Building 853. The path corresponds to the primary impact area as determined from the Phase I investigation. A test stand possibly used for testing M69X bombs is 300 ft northeast of the observation bunker on Drawing AG-7. The test stand was not observed in the field, and no physical indications of drop testing activities in this area are evident. Site 36-2 is reported to have proof-tested M69 bomblets, although all activities were documented to occur within Building 725. The test stand described on Drawing AG-7 was either never constructed or used, or used and removed with no resultant wastes.

Comment 2:
paragraph 3.3
first bullet

Testing for IMPA will provide information on only one of the Army's potential degrading products. It is recommended all other Army degradation products which have certified methods also be checked during the analyses.

Response

IMPA (GB degradation products) and TDGCL (mustard degradation products) are two of the specific certified methods to detect Army agent degradation products. Both analyses are scheduled for Phase II samples from trenches, as are ICP metals, arsenic,

mercury, and semivolatile organic compound analysis. The semivolatile method is certified for the detection of DIMP, DMMP, oxathiane, and dithiane. The Phase II program as designed will provide complete information on agent degradation products, and the nontarget analysis should identify other compounds indicative of contamination. It should be noted, however, that no history of agent contaminated material is documented for this site.

Comment 3: paragraph 3.4

As with most of the post-Phase I contaminated soil volume revisions, the volume calculated for Site 30-1 is arbitrary and misleading. The boundary drawn for the "main impact area" is arbitrary. Undoubtedly there are UXO's outside this area which, because of their lower spatial density in a larger area than the "main impact area", will result in a relatively larger quantity of potentially contaminated soil to be handled.

Response

The boundary drawn for the main impact area has been determined from the RMACCPMT map, and supported by field reconnaissance and visual evidence. The volume of potentially contaminated soil has been estimated from chemical analysis results, geophysics, and historical research. Based on the Phase I investigation of the site, this estimate of potentially contaminated soil provides accurate information upon which to base feasibility assessments.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET—SUITE 500
DENVER, COLORADO 80202-2405

REF: 8HWM-SR

OCT 14 1987

Colonel W. N. Quintrell
Program Manager
AMXRM-EE Department of the Army
U.S. Army Toxic and Hazardous Materials Agency
Building 4460
Aberdeen Proving Ground, MD 21010-5401

Re: Rocky Mountain Arsenal (RMA),
Documentation of suspected laboratory
contamination.

Dear Colonel Quintrell:

EPA Region VIII nas the enclosed preliminary comments for Sites 4-5, 24-6, 2-8, 3-4, and supplemental comments on Sites 30-1, and 4-5 from our contractors. Our contact on this matter is Mr. Connally Mears at (303) 293-1528.

Sincerely yours,

Robert L. Duprey, Director
Hazardous Waste Management Division

Enclosure

cc: David Shelton, CDH
Chris Hahn, Shell Oil Company
R. D. Lundahl, Shell Oil Company
Thomas Bick, Department of Justice
Elliott Laws, Department of Justice
Preston Chiaro, Ebasco
Mike Witt, ESE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET—SUITE 500
DENVER, COLORADO 80202-2405

REF: 8HWM-SR

SEP 23 1987

Colonel W. N. Quintrell
Program Manager
AMXRM-EE Department of the Army
U.S. Army Toxic and Hazardous Materials Agency
Building 4460
Aberdeen Proving Ground, MD 21010-5401

Re: Rocky Mountain Arsenal (RMA),
Review of Final Phase I CAR Report for
Task 14, Site 30-1, Impact Area.

Dear Colonel Quintrell:

EPA Region VIII has reviewed the above referenced final report and has the enclosed preliminary comments from our contractors. Given the status of Phase II Remedial Investigation work at this site and the nature of the enclosed comments, it may be that our concerns can be addressed during the Feasibility Study for RMA. If you wish to pursue that option, please call Mr. Connally Mears at (303) 293-1528.

Sincerely yours,

Robert L. Duprey, Director
Hazardous Waste Management Division

Enclosure

cc: David Shelton, CDH
Chris Hahn, Shell Oil Company
R. D. Lundahl, Shell Oil Company
Thomas Bick, Department of Justice
Elliott Laws, Department of Justice
Preston Chiaro, Ebasco
Mike Witt, ESE

RESPONSES TO SPECIFIC COMMENTS OF ENVIRONMENTAL PROTECTION AGENCY ON THE DRAFT FINAL TASK 14 REPORT SITE 30-1: IMPACT AREA (VERSION 2.2)

Comment 1: The small drainage channel crossing through the southwest quadrant of the site should be shown on Figures 30-1-6 through 30-1-8. Are [illegible]eholes 5330, 5331, and 5337 located in this chan[illegible]? If so, the report should so state. If not, Phase II should sample this channel.

Response The small drainage has been added to Figures 30-1-6 thru 30-1-8. Boring 5347 was placed within this drainage.

Comment 2: Why wasn't a boring located in the mounded area adjacent to Boring 5330? Are these mounds from excavating the nearby trench, or are they burying something?

Response Field inspection of the mounds near Boring 5330 did not reveal any visual indications of disposal activity or debris. These mounds are the result of initial trench excavation based on proximity to the trenches and lack of visual soil contamination.

Comment 3: Why were no borings placed in the area labeled "Abundant Metal Debris" in the south central portion of the site?

Response No borings were placed in the area of "Abundant Metal Debris" based on results of a surface sweep of the area. Personnel with extensive knowledge of ordnance used and stored at RMA investigated the area, and recorded only innocuous metal surface debris.

Comment 4: The report states that the tentatively identified compound diethylene glycol occurred only in Lot BMS, and was therefore attributed to laboratory contamination. However, the three borings that it occurred in were all located in the same general vicinity and may not be laboratory induced since it did not appear in the blanks analysis. Therefore, diethylene glycol should be added to the analyte list for the Phase II borings.

Response Diethylene glycol (2,2'-oxybisethanol) is a common component of commercially available antifreeze. The compound was detected in three borings that were all in the same general vicinity. This compound was identified in several other Task 14 sites as well. All of these borings were drilled in the winter

months, when antifreeze may be used for field vehicles and equipment. Antifreeze is used overnight in the steam cleaner line and may have bled out of the line before decontamination procedures. Incomplete bleeding of the line may have contaminated both field equipment and the samples. Phase II borings proposed for this site include a GC/MS scan, which will detect diethylene glycol in the nontarget analysis.

Comment 5:

Numerous contamination assessment reports dismiss low concentrations of tentatively identified compounds and one target analyte (methylene chloride) as a "suspected laboratory contaminant". When analysis of the blanks do not support this conclusion, we feel the reports should substantiate the assertion with additional documentation from the laboratory QA/QC program. Several examples of hits dismissed as suspected laboratory contamination without supporting documentation are cited below.

Site	Boring(s)	Compound	Concentration
4-6	19	methylene chloride	3
30-1	5335, 5338, 5339	oxy-bis ethanol	0.5, 0.8, 0.9
24-6	4,11	methylene chloride	2, 3
2-8	6	methylene chloride	6 (No data on BLANKS)
3-4	3, 7, 8, 14	methylene chloride	1 - 5
4-5	11, 2, 10	methylene chloride	800, 50, 2

Response:

A position paper on "laboratory introduced" contamination is currently being assembled and will be presented to MOA parties upon completion.